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ROBERT J. BENFORD, *Colonel, USAF (MC), Editor*
BENNETT F. AVERY, *Captain, MC, USN, Associate Editor*
PATRICK I. MCSHANE, *Colonel, MC, USA, Associate Editor*

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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal*.

MELVIN A. CASBERG, M. D.,
Assistant Secretary of Defense (Health and Medical).

MAJOR GENERAL GEORGE E. ARMSTRONG,
Surgeon General, United States Army.

REAR ADMIRAL LAMONT PUGH,
Surgeon General, United States Navy.

MAJOR GENERAL HARRY G. ARMSTRONG,
Surgeon General, United States Air Force.

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Monthly Message

Current methods of procurement of career officers in the fields of medicine, dentistry, and nursing are not sufficiently productive both to replace those lost by attrition and to meet military requirements for regular officers. As a result, there are not enough regular officers in the military departments to insure that the military medical, dental, and nursing missions are accomplished. Because of this numerical insufficiency in the regular corps, extensive studies have been made on the feasibility of providing scholarships for students in medical, dental, and nursing schools. This has evolved into a proposed scholarship plan which is to be included as part of the legislative program of the Department of Defense.

The proposed legislation provides that the selection of students for participation in this program will be made from among those who have been accepted for admission to these schools. Their tuition fees will be paid and each will also receive a monthly allowance to cover part of his personal expenses incident to school attendance. Each student will be obligated to serve one calendar year on active duty in one of the military departments in return for each academic year of his scholarship. The proposed plan also provides for methods of release of participants.

Upon Congressional approval of this program, it is tentatively proposed to offer sufficient scholarships to provide approximately 300 graduates from schools of medicine, 125 graduates from schools of dentistry, and 285 graduates from schools of nursing at the end of the second year of operation of the plan, and the same number of graduates each succeeding year. I believe that this plan will provide a sufficient number of officers to build up the hard-core career service for the medical and health professional groups.

Melvin A. Casberg

MELVIN A. CASBERG, M. D.
Assistant Secretary of Defense
(Health and Medical)

MILITARY MEDICINE IN KOREA

MAJOR GENERAL GEORGE E. ARMSTRONG,
Surgeon General, U. S. Army

I am deeply appreciative of the opportunity to discuss some of the medical strides that were made during the fighting in Korea. Unification had its severest test in Korea. The undeniable victory of military medicine was not an Army victory, but rather a victory of the Army, Navy, and Air Force, all linked together in a magnificently effective medical team. Death and disease were our principal enemies and if we examine the records, there is absolutely no doubt that the results of our unified medical effort were little short of amazing.

First of all, were we to have had our choice of an area in which to fight a war, it would not have been Korea. When the Army was committed to action in June 1950, we faced the job ahead with no little apprehension; and justly so, because there is hardly another spot in the world where similar hot and dry summers are followed by such bitter cold winters. Coupled with the weather and climate, which always seemed to work against us, was the rough terrain, and a myriad of infectious diseases endemic to Korea. As the fighting progressed, the problem was further complicated by the thousands of refugees who jammed roads and served as a mobile source for the spread of infection and disease.

As we looked back on the proud medical record of World War II, we fully anticipated an increase in incidence and mortality from disease. Such was not the case. Although we had roughly eight times as many admissions for disease as for battle injuries and wounds, we succeeded in reducing the admission rate considerably below that for World Wars I and II. During World War I, for example, admissions were 852 per 1,000 strength per year. This was reduced to 588 in World War II, and was further reduced to 468 during the Korean conflict.

During the entire campaign, the troops did not suffer a serious epidemic of any kind. Some may say we were simply fortunate; perhaps we were, but much progress was made in infectious disease control, environmental sanitation, occupational health,

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and medical intelligence programs. We accelerated our aggressive preventive medicine campaign which was intended to halt the spread of disease and indoctrinate the individual soldier with a deep sense of personal responsibility for his own physical welfare. To assure continued use of approved sanitary measures, regular medical inspections—especially in rearward areas—were emphasized. Water points were carefully supervised. Immunization and vaccination methods were stringently adhered to, and disease control programs were maintained. The subsequent decline of disease rates gives a direct indication of the permanent value of these programs.

Probably the brightest spot in our chapter of disease experience was in the prevention and cure of malaria. Malaria has been of the most serious import in every war in which our country has been involved. Korea, with its mosquito-ridden rice paddies, was no exception. Because of our most active research and development program following World War II, we were able to supplant quinacrine hydrochloride with the newly developed chloroquine as a malaria suppressant. The soldier liked it because he only had to take chloroquine once a week and he never experienced the toxic symptoms produced by quinacrine. We liked it because it was effective against malaria in the clinical stage. Meanwhile, research on a cure for malaria was going forward and in the summer of 1951 primaquine, which had been developed under the joint sponsorship of our Medical Research and Development Board and the Public Health Service, appeared to be the best weapon against malaria in the tissue stage. In December 1951 we began routine administration of primaquine daily for two weeks to troops returning to the United States by ship. The very low rate of recurrence among these returnees bears out the fact that in the combined chloroquine-primaquine therapy, at last we have a cure for Korean vivax malaria.

ACUTE HEMORRHAGIC FEVER

The disease condition in Korea has not been entirely rosy, however. Early in 1951 our physicians were faced with a disease virtually unknown to western medicine, acute hemorrhagic fever. As soon as possible, we established a specialized treatment center in one of our evacuation hospitals and undertook a three-way effort to identify the vector, isolate the causative agent, and discover a specific treatment. Initially the fatality rate from the disease was in excess of 10 percent, but our scanty knowledge of the disease grew, and with the aid of an artificial kidney installed in our treatment center, the rate was cut to less than five percent. There is still much that we do not know about the disease so our research continues. To the best

of our knowledge the reservoir of infection is a species of rodent found in Korea, Manchuria, and Far Eastern Siberia.

Infectious hepatitis also has presented a serious problem to military medicine because of the long hospitalization required for the disease. Following World War II, our occupation forces experienced an outbreak of hepatitis, and we anticipated a similar serious problem among fighting troops in Korea. Peak incidence for the entire combat period, however, was less than 35 cases per thousand average strength per year, which occurred in February 1951. The rate steadily declined from that point and indicates that we have made some improvements in diagnosis, nutrition, and clinical management but specific curative treatment and method for prevention still remain as major problems.

WOUNDS AND BATTLE INJURIES

Our troops were not only fighting the enemy, but also had to contend with severe weather as well as a rugged mountainous terrain that constituted an ever-present barrier to good transportation. Shortly after the offensive that brought our troops to the Yalu River in September 1950, our admission rate for battle injuries and wounds climbed to a high of 1,187 per thousand average strength per year. The rate fluctuated a great deal during the hostilities and reached a low of 22 for March 1952. At no time did the death rate of the wounded exceed the 4.5 percent record for World War II, but fell to an all-time low of 2.3 percent for the entire Korean campaign. Considering the total number of men wounded in action in Korea, this means that there are about 2,000 soldiers living today who owe their lives to the increased effectiveness in the treatment of battle wounded. Along with this favorable picture, our efforts to return the wounded to duty have also been well rewarded. In World War II, we managed to return 77 out of every 100 wounded to duty. Although final figures for the Korean conflict are not available, it appears that the ultimate proportion will be in the neighborhood of 85 percent. Thus, attrition of our most valuable asset, manpower, has been further minimized.

Since the signing of the truce, we have had a little time to reflect on some of the factors that influenced our success in Korea. It is difficult to list them in order of their importance, or even to list them all. It was particularly fortunate that the many lessons learned in World War II were still fresh in our minds and that we could call on all types of key personnel who, just a few years before, had learned those lessons so well.

Our postwar graduate medical education programs also yielded untold benefits. In 1947 we had a total of 196 board-certified specialists in the Medical Corps of the Regular Army,

Navy, and Air Force. Shortly after hostilities broke out, that list had grown to almost 450. In the first critical days of the fighting, those specialists, assigned to key operational positions together with the resident physicians who were taken out of hospital training, played a vital role in establishing our medical program keyed to combat activity.

SUPPORT BY NAVAL RESERVE OFFICERS

Strong support to the total effort in Korea was given by the 570 young medical officers of the Naval Reserve who were assigned to the Army in the difficult early days of the conflict. Both as physicians and officers, they were an exceptional group. Their transition from Navy to Army procedures was accomplished with very little difficulty and they soon won the wholehearted plaudits of both line and medical officers wherever they served. Their return to the Navy the following year was accomplished conscientiously but regretfully.

When American forces were compressed into the Pusan perimeter, we came to realize the invaluable service given by the floating hospitals of the Navy. Each time I visited the combat area, I was highly impressed with the fine professional work they were doing.

The fact that combat activity was confined to a relatively small area gave us an unusual opportunity to concentrate on all phases of medical care and treatment. We had complete control of the air and sea between the combat zone and Japan and from Japan to the United States. Our medical supply system functioned like clockwork and from the beginning provided ample quantities of all supplies, including whole blood and the latest antibiotics, neither of which was available early in World War II.

The mobile Army surgical hospitals and the Navy medical surgical teams performed gallantly in providing definitive surgical treatment closer to the front line than ever before.

The helicopters operated by the Air Force and the Marine Corps were quick to earn the respect and affection of both the soldier and the medic as an indispensable means of evacuation. During the Korean fighting, the helicopters and the conventional fixed-wing planes evacuated over 60,000 wounded from the combat area. As a result, it was decided that the Army Medical Service should include the helicopter ambulance unit as an integral part of its field organization.

The incomplete list of factors that I have just related is by no means cause for complacency. On the contrary, it indicates that there is always room for increased knowledge, better tech-

nics, and more technical developments. I do not believe that we can have an effective medical program without realistic, forward-looking research and development.

RESEARCH AND DEVELOPMENT

During the Korean campaign, research and development not only continued but was conducted in the combat zone to an extent never before realized possible. Several teams were sent into the area to find the answers to difficult questions of medicomilitary importance.

One of the first such problems was that of cold injury. The first patients with cold injuries were reported in November 1950, when the Eighth Army pushed the enemy back to the Manchurian border. As soon as the Chinese communists entered the war and forced the withdrawal from North Korea, cold injury rates ballooned. Troops fought and lived in temperatures as low as 25 degrees below zero. Entire units were cut off and pinned down by enemy action; and exposure, loss of clothing and equipment, and lack of hot meals took their toll.

A cold-weather indoctrination program that reached every soldier helped start the steady decline of cold injury rate. A team was dispatched to study the problem, live with the men, ask questions, make observations, and get some of the answers. The team returned to the United States and set down some 29 conclusions and 14 recommendations—some of which were adopted. It also recommended more than a dozen areas in which further study is needed. We shall continue to study the problem.

Meanwhile, it became apparent that the fatality rate had reached a new and probably irreducible low level, but the same reduction in the death rates had not extended to the battlefield. In an effort to determine whether there was any chance of reducing the number of battlefield deaths, a team was sent to Korea to make a missile casualty survey. They studied 4,600 cases of "killed in action" and "wounded in action." The data from that study revealed that a lightweight armor would probably reduce deaths among troops exposed to the enemy. The team joined forces with other elements of the Army and with the medical department of the Navy, and devised the eight-pound nylon armored vest. Follow-up studies of the prototype revealed these amazing results:

1. Two thirds of all missiles hitting the armor; three quarters of all fragments, which account for most of the wounds; and only one fourth of all small arms missiles were stopped.

2. The vest reduced the incidence of chest and upper abdominal wounds by about two thirds, and about one fourth of the chest and upper abdominal wounds sustained by soldiers wearing the vest were reduced in severity.

3. The vest was acceptable to most of the soldiers who wore it in combat. Work is now under way to further perfect the vest and to produce an acceptable pair of shorts that will give the same degree of protection to the hips, buttocks, and groin. These developments will not lighten the burden of the field surgeon, but fewer of his casualties will die on the battlefield.

SURGICAL RESEARCH TEAM

In January 1952, a surgical research team sent to Korea concentrated at one of the forward mobile Army surgical hospitals and also established a renal research center at an evacuation hospital. The team found that most wounded men who reached the medical evacuation chain were effectively managed and recovered with low morbidity and minimal crippling compatible with their wounds. The havoc resulting from hemorrhage and infection has been reduced almost to the vanishing point by the sum total of surgical care. Of these wounded, from 2.5 to 4 percent will die, and, of these, almost one half die as a result of direct injury to a major organ. It is to the remaining group, comprised of from 1 to 3 percent of the total wounded, that surgical research has been directed. These men sustain major multiple wounds not fatal per se, but fatal because of their remote consequences. We firmly believe that major investigative and therapeutic effort is justified to save these lives, even though it is a statistically minor group of the wounded.

One of the bright chapters in military surgery and interservice co-operation was written in the field of vascular surgery. At the same time that Navy surgeons were making progress in vascular surgery, the Army was fortunate to have an Air Force surgeon head its program and report outstanding successes. In the Eighth Army alone, almost 300 repairs of peripheral arteries were performed, and success was attained in about 80 percent of the patients as compared with 81 arterial repairs and success in 50 percent during World War II.

Notable progress was also made in other fields, such as in the treatment of shock, wound débridement and closure, control of infections, blood replacement problems, stress, plasma volume expanders, lower nephron nephrosis, and a host of others.

Research on these and many others all add up to three important factors that transect all lines of our endeavors toward providing a better medical service for the troops: (1) The fruits

of such research improve the level of medical care in the combat zone. (2) The teaching aspects not only develop new concepts and methods, but have a very favorable effect on medical officer morale. (3) Such research provides the most severe testing ground for new devices, drugs, and technics.

Though my account has been somewhat superficial, I have attempted in the time available to give at least some of the highlights of three years in Korea. I sincerely hope, as you do, that the hostilities in Korea have been permanently terminated. In peace or in war, however, we will continue not only to provide an effective medical service but will strive constantly to improve our service by taking advantage of every possible opportunity.

Patient Co-operation in Heart Disease

One of the most vital of all the factors in prognosis of heart disease is the co-operation of the patient himself. He should have enough understanding of his condition and of the treatment, including even the minute details thereof, and enough confidence in his physician to follow his recommendations wholeheartedly. The difference between life and death may easily depend on this factor. That is why it is so essential for the physician to establish at the very beginning a good relationship and to take time to explain as fully as necessary what is wrong and what should be done, without going into tedious detail or recounting all the bad complications that could develop. An hour spent thus may save weeks and months of miserable apprehension and unhappy rebellion. I cannot overemphasize the value of this relatively simple measure that can so vitally affect both prognosis and treatment. Also it saves the time and energy of the patient who, not learning enough from his physician, surreptitiously or even openly resorts to medical or quack literature. If inadequately informed, the patient may "shop around" until he finds a physician or clinic to give him advice to suit his fancy.

—PAUL D. WHITE, M. D.
in *Journal of the American Medical Association*, p. 79, Sept. 12, 1953

VASCULAR SURGERY AT WALTER REED ARMY HOSPITAL

I. Introduction

SAM F. SEELEY, *Brigadier General, MC, USA*

IN the summer of 1949, a program was initiated for the development of vascular surgery on the neurosurgical, thoracic, and general surgical sections of the surgical service. Experience gained in World War II, and the availability of adequate quantities of whole blood and expert anesthesiologists, made it worthwhile to develop a center for the treatment of vascular lesions in members and dependents of the Army and Air Force. In the fall of 1949, a blood vessel bank was developed and early in 1950, Walter Reed Army Hospital was designated as a surgical center for vascular lesions.

The heart, the pericardium, the major arteries, the veins of the portal system, and even a few major vessels within the skull are now operated on when proper indications arise. Some surgical procedures within and through the thorax have been well established; the combined thoracicoabdominal approach, where indicated, is employed without significant increase in the hazard to the patient. In general, preserved blood vessels are used as grafts in the correction of obliterations, aneurysm, coarctation of the aorta, and lesions of the other large arteries. In most peripheral vascular lesions, sections of autogenous saphenous or cephalic veins are used for grafts.

Vascular conditions requiring surgery are congenital or acquired. Among the congenital lesions are the intracranial arterial aneurysms, anomalies of the heart and great vessels, multiple congenital arteriovenous fistulas of the extremities, congenital phlebectasia, and vascular nevi. Acquired lesions include those produced by wounds, such as false aneurysms and arteriovenous fistulas; those resulting from infections, such as mitral valvular lesions; and those due to hepatic cirrhosis, the most frequent cause of portal hypertension.

Vascular war wounds fall into three major categories; acute, intermediate, and chronic. Based on the experience gained in the definitive surgery of arteriovenous fistulas and false aneurysms,

Gen. Seeley is now at Headquarters, U. S. Army, Europe.

members of our staff, stationed in Korea, have demonstrated that re-establishment of the continuity of major arteries a few hours after wounding is feasible and materially decreases the percentage of amputations due to vascular insufficiency. Expanding false aneurysms, because of threatened rupture or pressure upon major nerve trunks, require immediate operation.

The following four articles deal with our experiences in vascular surgery from July 1949 to May 1953. Among these are included such rare conditions as congenital phlebectasia of the internal and external jugular veins, multiple congenital arteriovenous fistulas of the extremities and lungs, segmental arterial occlusion, and abdominal aortic aneurysms.

Proficiency gained by the residents and staff in vascular surgery at this center will prove invaluable to the armed services in the years to come. Training and experience in boldness of exposure, prevention of hemorrhage, and meticulous technic will serve to qualify surgeons in the art of operating on the vascular system. It will develop confidence in the performance of other major surgical procedures. It will stimulate professional advancement by the knowledge that the repair of great vessels damaged during operation, or by trauma, or involved by neoplastic growth will be dealt with successfully.

Finally, the referral of patients with complicated vascular conditions to this center gives additional service to the staffs of all hospitals throughout the Army and Air Force.

II. Cerebral Aneurysms, Arteriovenous Anomalies, and Carotid Artery Cavernous Sinus Fistulas

GEORGE J. HAYES, *Lieutenant Colonel, MC, USA*

HARRY F. STEELMAN, *Captain, MC, USAR*

IMPROVEMENT in technical aids available to the neurosurgeon has lowered the operative mortality of patients with vascular intracranial lesions to the level of that for other major brain lesions. Furthermore, hemorrhage from intracranial vascular lesions carries a risk to life of about 50 percent and a risk of serious neurologic disability almost as great. It is imperative, therefore, that patients suspected of having one of these conditions be given the benefit of neurosurgical evaluation.

During the years 1946 through 1952, 62 patients were treated for intracranial vascular lesions by various members of the neurosurgical staff of this hospital. The size and location of

the lesion was determined by history, neurologic signs, arteriography, electroencephalography, and occasionally by pneumoencephalography. These vascular lesions have been classified in three groups: (1) saccular or berry aneurysms of the circle of Willis; (2) congenital arteriovenous anomalies or varices of the brain; and (3) acquired arteriovenous fistulas of the internal carotid artery and the cavernous sinus.

ANEURYSMS

The largest number of patients (40) had a saccular aneurysm manifested by subarachnoid hemorrhage or the sudden development of focal neurologic signs. Because the mortality is so high, due to the initial or subsequent hemorrhage from such a lesion, an operation should be considered. Each patient must be evaluated on an individual basis and the particular operative procedure that will secure maximal results with minimal risk should be adopted.

When preliminary compression of the artery is tolerated for 30 minutes without producing neurologic signs, aneurysms of the internal carotid artery below its bifurcation should be treated by initial ligation of the artery in the neck. If the patient's age and general condition permit, the neck ligation should be followed by placing clips on the intracranial portion of the internal carotid artery, thus trapping the lesion between clips and ligature and isolating it from the circulation. Those aneurysms located on the anterior communicating artery should not be operated on because the risk to the patient is as great or greater than if the lesion were left alone.

Middle cerebral artery aneurysms on the dominant hemisphere should be treated by ligation of the carotid artery in the neck. If the aneurysm is on the nondominant hemisphere and has a neck to which a clip can be applied, intracranial approach should be done.

An aneurysm in the posterior fossa should be exposed and clips applied, if it is located on an artery which can be sacrificed with safety. Otherwise, only packing with muscle is justified. Ligation of the vertebral artery is not advised.

The results of surgical treatment are tabulated to show the operative procedures used and the risk of hemiplegia and death (table 1). Five patients had a ligation of the carotid artery in the neck as the only treatment; there were no deaths and one hemiplegia. Thirty-five patients had an intracranial operation with two deaths and three hemiplegias. Of the 35 patients, 16 had a combined intracranial approach and ligation in the neck with one death and two hemiplegias.

TABLE 1. *Results with intracranial aneurysms*

Treatment	Cases	Hemiplegia	Deaths
Occlusion neck of aneurysmal sac:			
With removal of aneurysm	3	0	0
Without removal of aneurysm	5	0	0
Trapping carotid artery between intracranial clip and ligation in neck	16	2	1
Trapping aneurysm between intracranial clips	10	1	1
Packing aneurysm with muscle	1	0	0
Intracranial operations of all types	35	3	2
Ligation of carotid artery in neck only	5	1	0
Total	40	4	2

Of the 40 patients with aneurysms treated surgically, there were two deaths and four hemiplegias. All patients surviving operation are alive and have had no recurrence of symptoms or signs.

CONGENITAL ARTERIOVENOUS ANOMALIES

These lesions grow progressively until their presence is evidenced by recurrent epileptic seizures or subarachnoid hemorrhage.

TABLE 2. *Arteriovenous anomalies*

Treatment	Number	Deaths	Sequela due to operation	Improved
Excision	6	1	0	4
Decompression	2	0	0	0
No surgery	8	0	0	0
Total	16	1	0	4

Operative excision of these lesions is a formidable task accompanied by high morbidity and mortality in unselected cases. Furthermore, the risk to the patient's life from repeated hemorrhage is much smaller than that in patients with saccular aneurysms. These factors mitigate against surgical operation except when one or more of the following conditions are present:

(1) uncontrollable epileptic seizures; (2) history of two or more subarachnoid hemorrhages; (3) presence of intracerebral hematoma as evidenced by shift of blood vessels in the arteriogram; and (4) location of the lesion in a place where excision can be done without producing hemiplegia or aphasia.

Roentgen-ray therapy is not advised. Ligation of the carotid artery in the neck is seldom indicated because collateral circulation will quickly develop in the lesion from the circle of Willis. The results obtained by operation on 16 patients with arteriovenous anomalies are shown in table 2.

CAROTID ARTERY CAVERNOUS SINUS FISTULAS

This condition is usually caused by nonpenetrating trauma to the head, with or without fracture of the bones in the region of the cavernous sinus. This arteriovenous mass becomes progressively larger, producing a machinery-like bruit, pulsating exophthalmos, ocular palsies, and loss of vision in the affected eye. If untreated, the lesion becomes larger with increasing neurologic deficit and eventual death by rupture.

Initial treatment requires ligation of the internal carotid artery in the neck. If the fistula persists, the internal carotid artery within the cranium should be exposed and clips applied, thus trapping the lesion between the ligature in the neck and the intracranial clips.

A total of six patients with this lesion have been operated on and cured. All patients required intracranial applications of clips after ligation of the internal carotid artery in the neck. There were no postoperative deaths or hemiplegias. One patient died two years after operation from rupture of a berry aneurysm on the opposite carotid artery.

SUMMARY

Sixty-two patients with various types of intracranial vascular lesions have been operated on in this series. In 40 patients with saccular aneurysms of the circle of Willis, there was a mortality rate of 5 percent and a hemiplegic morbidity of 10 percent; in eight patients with arteriovenous anomalies of the brain there was 13 percent mortality and no hemiplegic morbidity. Six patients with carotid artery cavernous sinus fistulas were treated by ligation of the internal carotid artery in the neck followed by applying clips to the intracranial carotid artery with no operative mortality or morbidity.

III. Vascular Lesions of the Heart, Pericardium, and Thoracic Aorta

JOHN S. PAUL, *Lieutenant Colonel, MC, USA*

SANFORD W. FRENCH, III, *Colonel, MC, USA*

THE thoracic surgical section of this hospital has participated in the cardiovascular surgery program since 1950. From a meager beginning, the program has consistently advanced to include more and more vascular defects which are either correctable or improved by surgical means. Some of these include the treatment of (1) patent ductus arteriosus, (2) coarctation of the aorta, (3) certain congenital and acquired cardiac defects, (4) constrictive pericarditis, (5) reparable cardiac injuries, and (6) pulmonary arteriovenous fistulas.

In order to properly treat the above-mentioned conditions, a cardiac catheterization laboratory, under the cardiology section, and an arterial bank were established.

The number of patients with any particular condition has not been large, with the possible exception of those with a patent ductus arteriosus, but there has been considerable variety. All patients with vascular defects are systematically examined preparatory to a joint session attended by cardiologists and surgeons. Table 3 shows the number and variety of operations done.

LIGATION OF PATENT DUCTUS ARTERIOSUS

Fifty-two patients with a patent ductus arteriosus were operated on. The majority of these patients were children, and simple ligation and suture ligature after the method of Blalock was carried out. Several cases in the older age group required division and suture of the ductus. The number of patients being operated on is steadily increasing. The mortality from this operation has been zero.

MITRAL COMMISSUROTOMY

Twenty-six mitral commissurotomies have been performed, two in 1951, 12 in 1952, and 12 in the first half of 1953. The mortality has been zero in those patients who had mitral commissurotomies. One patient died 30 days postoperatively of congestive heart failure and lung abscess. The patient's condition at the time of operation, after the chest had been opened, was so precarious that the heart was not opened. In retrospect, had the operation been carried out, even in spite of the patient's poor condition, she might have survived. It has been

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our experience that patients who undergo thoracotomy without actual fracture of the mitral valve do very poorly postoperatively. In two other patients who survived thoracotomy, the valve was not fractured because of a vestigial auricular appendage.

TABLE 3. *Thoracic vascular operations*

Operation	Year					
	1948-49	1950	1951	1952	(Jan-June) 1953	Total
Ligation of patent ductus arteriosus	7	9	9	17	10	52
Mitral commissurotomy	0	0	2	12	12	26
Pericardiectomy	1	0	5	3	1	10
Resection of coarctation of the aorta	0	6	2	1	0	9
Blalock-Taussig operation	1	1	0	3	0	5
Excision of pulmonary arteriovenous fistula	2	0	0	1	0	3
Division of double aortic arch	1	0	1	0	1	3
Thoracotomy with cellophane wrapping of aorta	0	0	1	0	0	1
Excision, foreign body, myocardium	0	1	0	0	1	2
Exploratory thoracotomy for superior caval obstruction	0	0	0	1	0	1
Total per year	12	17	20	38	25	112

The long-term postoperative care of these patients is carried out by the cardiology section and includes, in some patients, cardiac catheterization. The clinical results as evidenced by the patient's general over-all state of health have been excellent and very encouraging. These patients are recalled at six-month intervals for evaluation.

PERICARDIECTOMY

Ten pericardiectomies were done; none of the patients died. The clinical results have been excellent as evidenced by a

decreased venous pressure, disappearance of signs and symptoms of congestive heart failure, loss of dyspnea, and a general feeling of well being. These patients are followed at periodic intervals postoperatively by the cardiology section.

RESECTION OF COARCTATION OF THE AORTA

Resections were done in nine patients with coarctation of the aorta and two died. One death was caused by renal failure nine days postoperatively and the other resulted from disruption of an intercostal vessel on the aortic graft some six weeks after repair. The results in the survivors were excellent and hypertension was reduced.

BLALOCK-TAUSSIG OPERATION

This procedure was performed on five patients with no mortality. The results were good as evidenced by reduction in cyanosis, drop in hematocrit, and increased physical stamina. Our follow-up on this type of case has been poor due to the transfer of the patient or his parents.

EXCISION OF PULMONARY ARTERIOVENOUS FISTULAS

Three patients were operated on for pulmonary arteriovenous fistula. The fistula in two were eradicated by lobectomy and in one by basilar segmental resection. A report of the last case is now in the process of preparation for publication. There has been no mortality.

DIVISION OF DOUBLE AORTIC ARCH

Division of a double aortic arch was performed in three patients; two died. The ages of the three patients ranged from three to seven months, and their condition was very poor due to the long standing tracheal and esophageal obstruction, resulting in feeding problems and recurrent episodes of pulmonary infection. One patient, after an apparently successful operation, died eight hours later from cardiac arrest incurred by an ill-advised tracheal aspiration. This patient had developed cardiac arrest as soon as the chest was opened but was quickly brought back into a normal rhythm by cardiac massage. The other death occurred 10 hours postoperatively in a patient who had multiple congenital anomalies including absence of one half of the circle of Willis, pterygium, spermatocele, and a single arterial trunk which served as the arch of the aorta, the left pulmonary artery, and the descending aorta. This trunk emerged from the right ventricle. The two left pulmonary veins emptied into the right atrium.

ADDENDUM. Since preparing this article for publication, the following additional operations were done: ligation of patent ductus arteriosus in three patients; one mitral commissurotomy; resection of coarctation of the aorta

in five patients (with one death due to sudden hemorrhage eight hours after operation); one Blalock-Taussig operation, during which the patient died; and division of a double aortic arch (in a 21-year-old patient). Pulmonary valvulotomy (Brock procedure) was done in two patients with so-called pure pulmonic stenosis, resulting in immediate reduction of cyanosis and dyspnea. Aortic-pulmonary anastomosis (Potts' systemic-pulmonary shunt operation) was performed in one patient with gratifying early postoperative improvement.

IV. Traumatic Arteriovenous Fistulas and False Aneurysms

EDWARD J. JAHNKE, Jr., *Major, MC, USA*
CARL W. HUGHES, *Lieutenant Colonel, MC, USA*
DONALD CAMPBELL, *Lieutenant Colonel, MC, USA*

DURING the past three and one-half years, 176 patients with 182 traumatic peripheral vascular lesions were treated at this hospital. All were the result of the Korean conflict. In addition, many patients with thrombosis of the aortic bifurcation (Leriche syndrome), arteriosclerotic segmental occlusion of peripheral arteries, abdominal aortic aneurysms, phlebectasia of the jugular vein, and congenital hemangiomas and arteriovenous fistulas have been treated. In the vast majority of these lesions, major arterial continuity has been restored by anastomoses or grafting procedures. This presentation, however, will be limited to the surgical management of the 182 traumatic lesions resulting from war wounds.

TABLE 4. *Distribution of arteriovenous fistulas and false aneurysms*

Location	Number of arteriovenous fistulas	Number of false aneurysms	Total
Head and neck	14	3	17
Upper extremity	28	29	57
Lower extremity	80	28	108
Total	122	60	182

The arteriovenous fistulas accounted for 122 of the lesions, and the remaining 60 lesions were false aneurysms. Six patients had two vascular injuries. The lesions have ranged in location from a fistula of the supra-orbital vessels to an aneurysm of the deep plantar arch of the foot. Two thirds of the lesions have been in the lower extremities with the remaining one third in the head, neck, and upper extremities (table 4). Of the entire

group of lesions herein reported, 38 were operated on in 1950, 81 in 1951, 38 in 1952, and 24 in the first half of 1953.

Following the teachings of World War II, the lesions were managed initially by obliterative operation. Regardless of the artery involved, arteriovenous fistulas were treated by quadruple ligation or endoaneurysmorrhaphy and false aneurysms were treated by arterial ligation. In all instances, the lesion itself was excised. To utilize these methods, it was imperative that operation be delayed at least three months to allow optimal development of an adequate collateral circulation. Of 116 lesions involving major vessels, the first 28 were treated in this manner. Though no limbs or digits were lost postoperatively, nine of the patients had varying degrees of symptomatic arterial insufficiency. The adjunctive pre- or postoperative employment of lumbar sympathectomy had little effect in diminishing the symptoms of insufficiency.

Postoperative arterial inadequacy was only one of the problems encountered. Awaiting development of collateral circulation required prolonged hospitalization. Some patients had large aneurysms that caused discomfort, pain, and continued concern that rupture and hemorrhage might occur. Some lesions enlarged and bled, while others exerted damaging pressure on contiguous nerves and other vital structures. Early reparative operation, eliminating the delay period for the development of collateral circulation, seemed to be the solution to these problems. Thus it was decided to re-establish vascular continuity in all major arteries by direct anastomosis. If this was not possible, homologous artery or autogenous vein grafts would be employed as an alternative method of repair.

Direct end-to-end anastomosis or simple division of the fistula, similar to a patent ductus, became the procedure of choice in most instances. Use of the latter method was limited to those patients in whom the fistulous tract was of narrow diameter. It could not be employed in aneurysms. In several patients, simple transverse arterial suture was possible. Usually one or two centimeters of artery could be resected and still permit end-to-end apposition without excessive tension. Sixty-two major arteries were anastomosed or repaired without grafts, and only two subsequently became thrombosed. One of these occurred at the site of anastomosis following sustained spasm, the result of undue tension on the suture line. The second thrombosis followed transverse repair of an arterial laceration.

Homologous artery grafts were obtained from the hospital graft bank. Six such grafts have been used, one each in the subclavian, axillary, brachial, common iliac, common femoral,

TABLE 5. *Treatment of patients with lesions involving major arteries*

Artery	Total	AVF*	FA**	Type of treatment					
				Ligation	Divided fistulous tract	Lateral repair	Anasto-mosis	Vein graft	Artery graft
Carotid	7	7	0	1	2	0	3	0	0
Subclavian	6	5	1	2	0	1	2	0	1
Axillary	19	8	11	4	0	1	7	4	1
Brachial	17	8	9	5	1	1	8	1	1
Iliac	2	1	1	0	0	0	1	0	1
Common femoral	7	5	2	0	2	0	2	2	1
Superficial femoral	28	24	4	7	1	0	14	6	0
Popliteal	30	20	10	9	2	1	13	3	1
Total	116	78	38	28	8	4	50	16	6

*AVF = Arteriovenous fistula.
**FA = False aneurysm.

and popliteal arteries. In every instance, excellent pulsations were present in the involved extremity following operation.

TABLE 6. *Treatment of patients with lesions involving minor arteries*

Artery	Total	AVF*	FA**	Type of treatment	
				Ligation	Anastomosis
Supraorbital	1	0	1	1	0
Superficial temporal	3	2	1	3	0
Vertebral	2	2	0	2	0
Internal carotid	1	1	0	1	0
Inferior thyroid	2	2	0	2	0
Thoracoacromial	2	2	0	2	0
Thoracodorsal	2	1	1	2	0
Posterior humeral circumflex	2	1	1	2	0
Profunda brachii	1	0	1	1	0
Radial	5	1	4	4	1
Ulnar	2	1	1	2	0
Volar interossei	1	1	0	1	0
Common digital	1	0	1	1	0
Branch to sartorius muscle	1	0	1	1	0
Profunda femoris	7	7	0	7	0
Lateral femoral circumflex	2	1	1	2	0
Medial inferior genicular	3	2	1	3	0
Posterior tibial	11	9	2	11	0
Peroneal	9	8	1	9	0
Anterior tibial	5	2	3	5	0
Dorsalis pedis	1	0	1	1	0
Deep plantar arch	1	1	0	1	0
Total	65	44	21	64	1

*AVF = Arteriovenous fistula.
**FA = False aneurysm.

In three, follow-up has shown evidence of structural change. The graft in the subclavian artery underwent slow occlusion four months after insertion as evidenced by decreasing pulse volume and blood pressure in the involved extremity. Explora-

tion at a later date for concomitant nerve injury revealed the graft to be patent and functioning but surrounded by scar tissue. The graft in the axillary artery showed similar clinical evidence of change. It was minimal and manifested by a 10-millimeter drop in blood pressure in the affected arm. The graft in the common iliac artery ruptured on the thirtieth postoperative day because it had been partially suspended through a large aneurysmal sac and did not have adequate viable coverage.

Sixteen autogenous vein grafts, obtained from the brachial, saphenous, superficial femoral, and popliteal veins, were employed successfully in the axillary, brachial, common femoral, and popliteal arteries. Only one failure occurred in this group; a thrombosis developed following infection in the false sac which had been left in place adjacent to the graft. All other vein grafts remained patent and functioned adequately as demonstrated by arteriogram (table 5).

Utilizing these methods, 84 (75.9 percent) of 116 major vessel injuries have been operated on with re-establishment of arterial continuity. Postoperative symptomatic insufficiency occurred in three patients, all of whom had thrombosed repairs. This was an incidence of 3.5 percent as compared with 32.1 percent in patients treated by ligation. Since major arterial continuity is now restored in all patients, no operative delay is necessary for the development of collateral circulation. Patients with expanding or bleeding lesions, or those with compressing nerves, are operated on without delay. The ultimate result has been the restoration of functional limbs, the avoidance of major nerve damage, and the decrease of hospitalization time.

The treatment of arteriovenous fistulas and false aneurysms involving minor vessels has remained the same throughout the entire series of 66 such lesions, namely, ligation and extirpation. The adequacy of additional arteries in the forearm and leg made vascular repair in these areas inadvisable and totally unnecessary (table 6).

SUMMARY

In a series of 182 vascular injuries in Korean battle casualties, arteriovenous fistulas account for 122 of the lesions and false aneurysms for 60. The treatment of choice in minor vessel injuries is quadruple ligation or simple arterial ligation with excision of the associated fistula or aneurysm. The first 28 major vessel lesions were treated in a similar fashion. This resulted in symptomatic arterial insufficiency in nine (32.1 percent) of the patients. In the remaining 84 patients with major lesions, arterial continuity was re-established by anastomosis or transverse repair in 62, by homologous artery graft in six, and by autogenous vein graft in 16. Failure occurred in four

instances. Thrombosis occurred in one anastomosis, one transverse repair, and one vein graft. Rupture occurred in one arterial graft because of inadequate coverage. Follow-up study has revealed symptomatic arterial insufficiency in only three patients (3.5 percent). Early restoration of arterial continuity is recommended in lesions involving major arteries if the greatest number of functional as well as viable limbs are to be obtained.

V. Portal Hypertension

EDWARD J. JAHNKE, Jr., *Major, MC, USA*
CARL W. HUGHES, *Lieutenant Colonel, MC, USA*
DONALD CAMPBELL, *Lieutenant Colonel, MC, USA*

A comprehensive study of portal hypertension of both the intrahepatic and extrahepatic type has been established at this hospital. It is a joint project combining the resources of the hepatic and gastroenterology sections of the medical service and the vascular section of the surgical service. After careful deliberation, a standard procedure was established for preoperative evaluation, operative approach, and long-term postoperative follow-up.

All patients had total and one-minute serum bilirubin, thymol turbidity, zinc sulfate turbidity, cephalin-cholesterol flocculation, sulfobromophthalein retention, prothrombin time, serum proteins, and occasionally Popper turbidity and cholinesterase determinations. The tests were repeated at biweekly intervals during the intensive preoperative medical management. Operation was delayed until the function studies indicated hepatic stability at the level of maximum improvement. They were then repeated daily for one week prior to operation to obtain a final base line. In the postoperative period, function studies were again repeated daily until they returned to the preoperative level or became stabilized at some other level.

An accurate evaluation of the degree of portal hypertension present was also made before, during, and after operation. Tests which would give direct objective evidence were used for the most part. These consisted of roentgenographic barium study of the esophagus, portal circulation time using the rectum-to-lung ether technic, esophagoscope examination with direct manometric measurement of the pressure in the esophageal varices, portal manometric pressure pre- and post-shunt, infrared photography of the superficial abdominal veins, and percutaneous splenic portal venography in selected cases.

The surgical procedure of choice in all patients was the direct end-to-side portacaval shunt utilizing the thoracico-

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abdominal approach. The splenorenal shunt was reserved for those patients in whom no adequate portal vein was available. Finally, in patients on whom no shunt could be established, less desirable procedures, such as hepatic artery ligation or simple splenectomy, were used. Patients seen during a bout of active hematemesis were treated conservatively by Sengstaken intraesophageal balloon tamponade. If this was unsuccessful, transesophageal ligation of the esophageal varices was performed.

TABLE 7. *Causes of portal hypertension and treatment in 36 patients*

Cause	Number of cases	Operation		
		Portacaval shunt	Splenorenal shunt	Other
Intrahepatic block				
Laennec's cirrhosis	25	20	2	3
Postnecrotic cirrhosis	7	4	2	1
Biliary cirrhosis	1	1	0	0
Total	33	25	4	4
Extrahepatic block				
Banti's disease	3	0	2	1
Total	3	0	2	1
Grand total	36	25	6	5

Thirty-six patients with evidence of portal hypertension and esophageal varices were operated on (table 7). Thirty-three of the patients had intrahepatic and three patients had extrahepatic blocks. Of those with intrahepatic block, 25 were due to Laennec's cirrhosis, seven to post necrotic cirrhosis, and one to biliary cirrhosis. Twenty-seven of the patients had had hematemesis on one or more occasions. In one patient, the bleeding was so severe that 76 pints of blood were required for stabilization.

Portal vein to inferior vena cava anastomoses were established in 25 patients, using the end-to-side technic in 24 and the side-to-side technic in one. Six patients were treated by the end-to-side splenorenal shunt with preservation of the kidney. Four of the six had an intrahepatic block and were explored with the intent of doing a direct portacaval shunt, but the presence of excess varix formation in the hepatoduodenal

ligament made this impracticable. The other two patients had Banti's disease, one of unknown origin and one had a portal vein thrombosis following a pyelophlebitis secondary to an appendiceal and hepatic abscess.

One patient, who preoperatively required 76 pints of whole blood, was treated by ligation of the hepatic and splenic arteries at the celiac axis. The portal pressure drop was from 418 to 180 mm. of saline. He has had no further episodes of bleeding. However, over a 20-month postoperative period, the pressure in the esophageal varices rose from 180 to 390 mm. of saline. This was within 30 mm. of his preoperative pressure. The result is considered a clinical failure because the patient still had tremendous varices with a markedly elevated pressure over the normal values of 80 to 120 mm. of saline.

A splenectomy alone was performed in two patients on whom no shunt was feasible because of cavernomatous changes in the portal vein and extremely friable varicosities of the splenic vein. Hepatic artery ligation was not considered in these patients because of the unsatisfactory results obtained in the previously described patient.

A splenectomy alone was also performed on a 10-month-old child with portal vein thrombosis because the size of the splenic and renal veins made an adequate splenorenal shunt impossible. The final patient was explored for a portacaval shunt which was technically not possible. He is now awaiting re-exploration for a possible splenorenal shunt.

RESULTS

Effects on liver function. Comparison of preoperative with postoperative liver function demonstrated several significant facts. There is a definite increase in hepatic dysfunction following operation. This lasts from about seven to 10 days and then remains essentially at the preoperative level. The amount of alteration observed varies with each patient but seems to correlate with the extent of anesthetic and operative trauma. Patients on whom operation required from two to three hours show only mild liver depression which lasts about four or five days. If the operation requires from five to six hours, the hepatic function is markedly depressed and may require a month to return to the preshunt level. Little correlation has been found between the degree of liver impairment prior to operation and the severity and period of additional dysfunction encountered after shunt. The use of intravenous aureomycin for three days postshunt has also been found to decrease the liver dysfunction in both good and poor risk patients.

On the basis of these findings, no patient has been refused operation regardless of the severity of liver disease as long as preoperative study indicated stabilization of the disease process.

Effect on portal hypertension. At operation, the measured portal pressures ranged between 300 and 550 mm. of saline in all but one patient. After establishment of the shunts, which varied from 1.5 to 2.5 cm. in diameter, there was a marked lowering of the portal pressure. In 80 percent of patients the drop was over 200 mm. of saline. In no patient was the final postshunt pressure over 280 mm. of saline. Thus all final readings were below 300 mm. of saline, below which postoperative hemorrhage is unlikely.

The changes noted in the portal circulation time also indicated effective portal decompression. Before shunt, the time ranged from 26 to 68 seconds, well above 25 which is the upper limit of normal. Repeat portal circulation time at frequent intervals after operation has been between 13 and 25 seconds. Since the portal circulation time is proportionate to the degree of portal hypertension, the results would again indicate the adequacy of the shunt.

TABLE 8. *Postoperative mortality in 36 patients*

Type of operation	Number of patients	Liver failure	Mortality (percent)
Extrahepatic block			
Splenorenal shunt	2	0	0
Other	1	0	0
Total	3	0	0
Intrahepatic block			
Portacaval shunt	25	2	8
Splenorenal shunt	4	0	0
Other	4	0	0
Total	33	2	6.1
Grand total	36	2	5.5

Another important indication of effectiveness of operation was seen on esophagoscopic examination. In 60 percent of patients, all varices disappeared following the shunt. In 20 percent, collapsed veins were seen but no pressure could be obtained. In the final 20 percent, varices were present but

were much smaller than before operation. In this group pressure readings were obtained in the varices. These readings were correlated with those obtained in the portal vein following shunt and have never varied more than 30 mm. of saline.

Mortality. There were two postoperative deaths in this series of patients, a mortality rate of 5.5 percent. One of these patients was an extremely poor operative risk at the onset. The liver function studies were markedly depressed and the patient was actively bleeding from the esophageal varices at the time of operation. An adequate shunt was established, dropping the portal pressure from 390 to 140 mm. of saline. The operation required six hours, and the patient needed 3,500 cc. of whole blood to combat shock. Postoperatively, the bleeding had stopped and it was believed the patient would recover. However, hepatic coma ensued, followed by renal shutdown, and death occurred on the fifth postoperative day. The other patient was an excellent surgical risk and an adequate shunt was established in a little over two hours. His postoperative course was uneventful until the fourteenth postoperative day when he became jaundiced and went into hepatic coma. On intensive medical therapy, including ACTH, the jaundice and liver function improved but the patient remained comatose. ACTH was discontinued on the forty-seventh postoperative day. An immediate relapse occurred with increased jaundice and liver dysfunction and the patient died on the forty-ninth postoperative day. At autopsy the shunt was patent as was the hepatic artery, the only positive finding being acute hepatic necrosis. It is still not known why this patient developed acute hepatitis or how it could have been prevented (table 8).

TABLE 9. *Incidence of postoperative bleeding in 36 patients*

Operation	Number of cases	Postoperative bleeding	
		Minor	Major
Portacaval shunt	25	1	0
Splenorenal shunt	6	1	0
Other	5	0	0
Total	36	2	0

Postoperative hemorrhage. There were two postoperative hemorrhages in the series of patients who were followed from two months to three years, an incidence of 5.5 percent (table 9). Both hemorrhages were mild and the patients have since gone two years without subsequent bleeding. In both patients small

varices with decreased pressure were found at postoperative esophagoscopic examination. One patient had a portacaval shunt four months prior to the hemorrhage. At that time the esophageal varix pressure was 210 mm. of saline. The second patient had a splenorenal shunt performed six months before the bleeding episode. At that time the esophageal varix pressure was 274 mm. of saline. Hemorrhage was not anticipated in either case because the postshunt pressure was below the 300 mm. critical level. It is encouraging, however, that they have gone two years without subsequent bleeding. This would indicate that factors, other than portal hypertension, may be partly responsible for hematemesis.

SUMMARY

In a study of 36 patients with portal hypertension, the direct portacaval shunt is considered the treatment of choice and was employed in 25 patients. A splenorenal shunt was necessary in six patients and five required less desirable procedures such as hepatic artery ligation and simple splenectomy. In this latter group, a shunt operation was not feasible for technical reasons.

A follow-up from two months to three years has revealed a postoperative mortality rate of 5.5 percent (two patients). There were two minor postshunt hemorrhages, an incidence of 5.5 percent. Both patients have since gone two years without subsequent bleeding. The over-all results indicate the value of the shunt operation in patients with portal hypertension and esophageal varices who have yet to experience their first, but perhaps fatal, hemorrhage.

Cardiologists have been impressed by the frequent association of coronary heart disease and gallbladder disease. The differentiation between biliary colic and an attack of angina is at times most difficult. There is a certain amount of evidence that coronary symptoms are aggravated by recurrent attacks of biliary colic. Surely it is better to remove the gallbladder early in a patient having myocardial damage than to wait until he develops one of the complications mentioned.

—CHARLES D. BRANCH

in *Surgery Gynecology and Obstetrics*, p. 247, Aug. 1953

ACTIVE TUBERCULOSIS IN NAVY NURSES, 1941-1950

ELIZABETH FEENEY, *Lieutenant, NC, USN*

SIDNEY A. BRITTEN, *Commander, MC, USN*

STUDIES of incidence rates for tuberculosis in naval personnel[1-3] revealed that nurses have had consistently higher rates than other naval personnel. A review of case records for 1949[4] suggested an association between cases developing among medical department personnel and the care of patients, although the number of cases during this year was too small for detailed analysis. A 10-year retrospective study of active tuberculosis among members of the Navy Nurse Corps was therefore initiated in the hope of assessing such factors as when the infection was acquired, selection, age, exposure, and assignments of personnel before and after entering naval service.

The authorized strength of the Nurse Corps as prescribed by Public Law 381 is 0.6 of 1 percent of the total naval personnel.[5] In the period 1941-1950, rapid mobilization resulted in an increase of the Nurse Corps from about 800 in 1941 to over 11,000 in 1945. The number dropped to approximately 5,500 in 1946, and decreased gradually during 1947-1950 to less than 2,000. During the last six months of 1950, the strength of the Corps again increased to over 2,000.[6]

METHOD

The central medical records of the 151 cases tabulated as tuberculosis in the statistical[7] and retirement files of the Navy Nurse Corps[6] for the period 1941-1950 were reviewed. Diagnoses were assigned, using the National Tuberculosis Association criteria then in effect.[8] Only those patients in whom bacteriologic confirmation was obtained, or serial roentgenograms of the chest revealed evidence of a changing lesion, or pathologic tissue findings were typical were classified as "active." The exceptions to this rule were eight patients with pleural effusion without bacterial confirmation; of these, six reacted positively to tuberculin skin tests, one had a doubtfully positive reaction when

From the Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C.

tested with 0.01 mg. of old tuberculin, and one apparently had not been tested.

Twenty-one percent of the patients were not classified as "active" because they had only unchanging roentgenographic evidence of pulmonary defect. Another 15 percent were excluded because of subsequent change in diagnosis to nontuberculous conditions or because they had been listed more than once by reason of complications or changes in the activity or extent of disease. One patient proved not to be a nurse. The remaining 100 patients were classified as "active," 83 having pulmonary and 17 extrapulmonary tuberculosis.

Questionnaires were sent to the 89 patients whose current addresses were known and to the schools of nursing in which they had been trained. The questionnaire to the patient concerned her childhood and adolescence and the physical examinations, chest roentgenograms, and clinical experiences undergone as a student and as a graduate nurse prior to and during naval service. The patient was also requested to supply information relating to her health following separation from naval service and to make suggestions for improving control or prevention of tuberculosis among nurses. Seventy-eight of the 89 patients responded and 74 gave permission for their schools of nursing to release abstracts of their records. Two additional requests were sent to the 11 patients who did not respond initially; because they are still on the retirement rolls it is presumed they are living but did not wish to participate in this study. The request to the school sought information relating to the physical examinations, chest roentgenograms, and tuberculin tests given to the student, as well as any clinical experiences. Sixty of the 74 schools receiving the requests returned the completed forms.

Comparison of information contained in naval records and in the completed questionnaires revealed rather close agreement on such matters as time and place of physical and chest roentgenographic examinations, student assignments, graduate experiences, and naval duty. In view of this agreement it was decided to rely on the patients' responses in areas not covered adequately by other records. In regard to contact with tuberculous patients, it might even be that the nurse knew the facts better than the administrator.

The histories of the 100 patients compiled from these sources were reviewed with respect to general background, age and incidence rates, and contact with tuberculosis, health programs followed, and clinical experiences obtained before and after entering naval service. These factors were compared with published surveys of similar factors to determine whether the en-

vironments of these patients were different from those which might be expected for nurses in general.

GENERAL BACKGROUND OF PATIENTS

The 100 patients in this study were white women diagnosed as having active tuberculosis while serving with the Nurse Corps, U. S. Navy, at some time during the period 1941-1950. Only two of the patients had entered naval service before 1940, while 72 had entered during the years 1942-1944. The length of graduate experience prior to naval service ranged from three months to 18 years, with 61 having less than two years of prior experience.

Figure 1. Geographic distribution before entering naval service.

The 100 patients were graduated from 94 schools of nursing in 30 states and the District of Columbia. Six schools were represented by two patients each; two were students in the same class, and six were members of the same student body for one school year. Sixty-one of the patients had been students in schools located in the Atlantic Coastal States and 36 were from schools in the Middle Atlantic region (New York, Pennsylvania, and New Jersey). Seventy-two patients were between 16-19 years of age at the time of admission to a school of nursing; the dates of graduation ranged from 1924-1948, with 73 graduating between the years 1939-1944.

As indicated in figure 1, almost two thirds of the patients (61) entered the service from the Atlantic Coastal States, where 62 of the patients were born and spent their childhood. Of the 100

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patients, 53 lived in urban, 29 in rural, and 18 in both rural and urban communities during childhood.

AGE AND RATES

The average age of nurses admitted for active tuberculosis during the 10-year period was 27.2; the average length of service was 26.1 months. Patients admitted with extrapulmonary tuberculosis were younger and of shorter service, 24.6 years of age and 9.9 months of service, respectively. The trend in rates for active tuberculosis among nurses rose from 1.5 per 1,000 average strength in 1941 to a peak of 4.6 per 1,000 in 1946. It then fell to 1.5 per 1,000 in 1948, where it remained until 1950, when it rose slightly. Both age and length of service distributions of the Nurse Corps were available only for the period 1945-1947. The rates for active tuberculosis during the three-year period were: for nurses under 25 years of age, 4.4 per 1,000 average strength; for nurses 25 to 29 years of age, 3.1 per 1,000; and for older nurses, 3.0 per 1,000. When length of service was considered, nurses with less than three years of service had a rate of 3.3 per 1,000 and those with longer service, 4.6; but statistical analysis of the data indicates that chance alone might account for these differences.

METHOD OF DISCOVERY

Table 1 shows that 58 cases were discovered by routine chest roentgenograms. If only pulmonary cases are considered, the percentage is 69, which is considerably higher than the 53 percent of pulmonary tuberculosis cases found by routine roentgenographic examination as reported in the 1949 study of tuberculosis among naval personnel.[4] Of the 58 cases detected on the periodic roentgenographic examination, 24 were found at the annual physical examination, eight at the end of the first six-months' probationary period, nine during or after tuberculosis ward service, four at the time of examination for promotion, one before going overseas, and 12 at the time of the physical examination before separation from service.

Of the 38 cases discovered through investigation of symptoms, all but nine patients had had the required periodic chest roentgenogram within 14 months of admission to the sick list, and in only two instances had the annual examinations been delayed for more than a year. In only 12 of the 38 patients were the routine roentgenograms prior to admission to the sick list available for review, and there is no assurance that they constitute an unbiased sample; of these, eight contained abnormal shadows which might have been considered cause for clinical investigation. The preservice roentgenogram of one nurse, whose most recent routine film was reported as negative, was positive on review.

TABLE 1. *Method of discovery of cases of active tuberculosis*

Diagnosis	Number of patients	Method of discovery		
		Routine chest roentgenogram	Appearance of symptoms	Not known*
Pulmonary tuberculosis				
Minimal	55	43	10	2
Moderately advanced	25	14	10	1
Far advanced	3	-	2	1
Extrapulmonary	17	1	16	-
Total	100	58	38	4

*Disease was detected after separation from service. All were hospitalized for tuberculosis less than nine months after release to inactive duty.

The 100 cases were detected at 23 different medical facilities; 13 cases being detected at one station. Of the 13, nine reported experience in tuberculosis wards and contact with tuberculous associates (nurse, corpsman, or doctor) at this station, two reported contact at previous stations, and two had had no known contact with tuberculosis at any time. Of the nine who reported contact at the station, four also had had contact in civilian life. Six of the 13 cases were found on routine chest roentgenograms for tuberculosis service, two on routine roentgenogram at the end of the probationary period, four when presenting symptoms, and one at the annual routine roentgenogram. Of the 13 cases, eight were minimal, two were moderately advanced, and three presented pleural effusions.

The preservice roentgenograms were available for review in 29 of the 100 cases. On review, 14 were negative, 12 were suspicious, and three were technically inadequate. Of the remaining 71 cases, the records showed that 67 were reported negative, three had defects noted but were considered not disqualifying, and in one case there was no record of any preservice film.

Sixteen of the 100 patients were admitted to the sick list for tuberculosis after less than six months of naval service. Six of these had minimal, five had moderately advanced, and one had far-advanced pulmonary tuberculosis, while four had pleurisy with effusion. The disease was discovered in seven of the 16 patients by routine, probationary period chest roentgenogram. Four of the preservice roentgenograms were found on review to be either suspicious or technically inadequate.

Although 100 percent efficiency in detecting small abnormal shadows is not to be expected even when roentgenograms are interpreted independently by two experts, these data serve to re-emphasize the care that must be exercised in reading large numbers of roentgenograms, among which only a few will reveal significant defects. They also suggest the importance of reviewing serial roentgenograms and of obtaining interpretations of at least two competent roentgenologists when passing on the fitness of candidates for the Navy Nurse Corps.

HISTORY OF TUBERCULOSIS CONTACT

The history of contact with tuberculosis of the 100 patients was compiled into four categories: (1) contact in naval service only, (2) contact in naval service and civilian life, (3) contact in civilian life only, and (4) no known contact. Contact with tuberculosis was considered to be: service on tuberculosis wards; familial contact; or exposure to patients or associates who were later found to be tuberculous. The number of contacts probably is incompletely reported because information in 22 cases is confined to the official records.

As indicated in table 2, 83 patients had had known contact with tuberculosis before being admitted to the sick list. Although the numbers reported are too small to support a definite conclusion, it appears that the possibility of contact with tuberculosis is greater the longer a nurse remains in naval service. This situation might be expected, inasmuch as a member of the Nurse Corps may be assigned to any type of clinical service, whereas she might choose not to practice in a particular clinical field in civilian life.

Thirty-one nurses had contact with tuberculosis at the naval station in which their disease was detected, 24 had contact at a station previous to the one in which it was diagnosed, seven had contact at both stations, and four reported contact while in naval service without indicating the station at which it occurred.

Of the 66 patients who had contact with tuberculosis in naval service, 55 had tuberculosis ward experience and 11 reported exposure to patients or associates who later were found to have tuberculosis. Twenty-nine of the 55 who were exposed in tuberculosis wards reported additional exposure to patients or associates who were later found to be tuberculous. The length of tuberculosis ward experience ranged from less than a month to 22 months, and the average time spent on tuberculosis wards was 4.6 months. Of the 40 exposures on other than tuberculosis wards, 10 were to patients only, 18 to associates only, and 12 to both patients and associates. In 21 instances close contact

TABLE 2. *History of contact with tuberculosis*

Place of contact	Number of patients	Months of service prior to admission to sick list				
		0-5	6-11	12-35	36-59	60 or over
In naval service only[1]	23	1	2	11	8	1
In naval service and civilian life[2]	43	8	6	19	9	1
In civilian life only[3]	17	2	8	6	–	1
No known contact[4]	17	5	2	8	2	–
Total	100	16	18	44	19*	3*

Information limited to official records:
[1] For three patients in this group; [2] for two patients in this group; [3] for ten patients in this group; [4] for seven patients in this group.
* One patient on second tour of duty, entire service is counted.

with the tuberculous person was reported. Of the 21 reporting close contact, six reported being examined every 2 or 3 months by means of chest roentgenograms, 11 reported no examinations, and four failed to answer the question. In six cases the type of ward in which exposure occurred was specified: two surgical, one general medicine, and three chest observation wards. Twenty-one nurses were listed as tuberculous contacts, 16 of whom were named. Of the 16, two were named twice by patients. All except one of the named contacts are included in this study.

Of the 60 patients who had known contact with tuberculosis in civilian life, five reported that the contact occurred during the preservice graduate period, 44 reported that it occurred during the student-nurse period, seven reported that contacts occurred during both the student and preservice graduate periods, and four reported that it occurred either before entering a school of nursing or outside the nursing environment. Forty-three of the 60 also had contact with tuberculosis while in naval service.

Six patients reported having practiced in tuberculosis nursing during their preservice graduate period. Five of these reported having 6, 10, and 13 months' and 2 and 10 years' experience, respectively, in this clinical service; the sixth reported being a supervisor in the operating room of a tuberculosis center for three years. Three patients reported occasional contact with known tuberculous patients during the course of their graduate duties as public health and staff nurses. Two patients had taken postgraduate courses in tuberculosis and communicable disease nursing prior to entering naval service but had not practiced in this field after completing the courses. Two nurses had familial contacts with tuberculosis during the period between graduation from a school of nursing and entering naval service.

Twenty-six patients had planned clinical experience in tuberculosis while student nurses; the experience varied from two weeks to three months, with one patient having such experience throughout her training. Twenty-nine patients reported exposure to patients or classmates who were later found to be tuberculous. Thirteen reported exposure to patients, 13 to classmates, and three to both patients and classmates. Eleven of the 29 reported that they had chest roentgenograms once after exposure; eight did not remember; and 10 stated that they had not had a roentgenogram. Six of the exposures to patients were on surgical wards, one was in chest surgery, and nine were on medical services. Three patients stated that they took strict precautions while they were student nurses when caring for suspected tuberculous patients.

HEALTH PROGRAMS

The health program in naval service relating to chest roentgenograms for nurse personnel is as follows: one roentgenogram is taken prior to active duty, one at the end of the first six months, one annually, and one before promotion, overseas assignment, or separation from the service. The policy governing routine, periodic, chest roentgenograms in relation to tuberculosis wards is the prerogative of the individual command of the naval medical facility.

As shown in table 3, at least 85 of the 100 patients had had routine chest roentgenograms within a year of admission to the sick list for tuberculosis. The five patients reporting chest roentgenograms every two or three months were on tuberculosis services at the time of admission, and three of those reporting the annual roentgenogram as the last before admission also reported having had chest roentgenograms every two or three months when working on tuberculosis services.

Only six patients reported that they had had tuberculin tests in naval service before hospitalization. These six were equally divided among those having and those not having contact with tuberculosis while in naval service.

During the period between graduation from a school of nursing and entrance into naval service, routine, periodic, chest roentgenograms were confined to those practicing in institutional and public health nursing.

Sixty-five patients had chest roentgenograms at some time while students in schools of nursing. Tuberculin tests were reported by 24 schools. Five students were reported to have converted to positive reactions during the first half of their second year, but no relationship to tuberculosis ward experience could be established. Only two students were reported as having tuberculin-negative reactions at the time of graduation from a school of nursing. Table 4 shows the increasing use of routine chest roentgenograms and tuberculin tests by schools of nursing during the period the 100 patients in this study were student nurses. Although our information relating to the health programs of the schools of nursing at the time these nurses were students is limited, the reported number that gave periodic chest roentgenograms is better than that reported by the 1944 United States Public Health Service survey.[3] The number of tuberculin tests reported is better also; 11 of the 60 schools gave tuberculin tests on admission, as compared with 11 of the 90 schools reported in the Health Service survey.

TABLE 3. *Last periodic chest roentgenogram received prior to admission to sick list*

Last periodic chest roentgenogram	Number of patients	Months of naval service prior to admission to sick list				
		0-5	6-11	12-35	36-59	60 or over
Annual	43	-	-	25	17	1
Semiannual	6	-	-	5	1	-
Every 2 or 3 months	5	1	2	1	-	1
At end of six-month probationary period	27	-	16	9	1	1
Preservice	19	15	-	4	-	-
Total	100	16	18	44	19	3

TABLE 4. *Roentgenograms and tuberculin tests while patients were in schools of nursing*

Year of graduation	Number of patients	Routine roentgenograms during training		Tuberculin test during training	
		Number	Percent	Number	Percent
Prior to 1933	7	-	-	-	-
1933 - 1938	13	4	30	1	8
1939 - 1941	28	18	64	6	21
1942 - 1944	45	36	80	13	29
1945 and later	7	7	100	4	57
Total	100	65	-	24	-

Illnesses prior to entering naval service that might be of significance were found in six instances. Two patients had spent nine and 18 months respectively in tuberculosis hospitals for pleurisy while student nurses; the semiannual roentgenograms of one patient, while a student nurse, showed pleurisy, right base; one patient, in her second student year, had pneumonia with effusion; one had a history of influenza three times while a student; and, as a graduate, one had been ill for five months with pneumonia complicated by pleural effusion, less than a year before entering naval service. One patient had a local and focal reaction to a tuberculin test while in student tuberculosis affiliation; the reaction was repeated prior to admission to the sick list in naval service.

On the basis of information available for this study, the query posed by Britten and Charter[3] as to whether the infection was acquired before or after entering naval service, cannot be answered. The limited number of patients who were tuberculin tested before and after entering naval service does not help to pinpoint the answer. In only 12 instances do the reported tuberculin test results serve to identify *approximately* when the infection *might* have been acquired: two before entering the nursing environment, five during the student-nurse period, and five after entering naval service.

The study did reveal that 83 of the 100 patients had known contact with tuberculosis; that the number reporting known contact with patients and associates on other than tuberculosis wards is about equal to the number reporting tuberculosis ward experience; and that in six instances the histories of illnesses prior to entering naval service might have been cause for failure to meet standards of physical fitness for commission.[10]

COMPARISON WITH PUBLISHED SURVEYS

An adequate unbiased sample of all nurses in naval service during the period of this study was not available for comparing background and experiences of the patients and the Nurse Corps as a whole. An October 1945 survey[11] was used for comparative purposes because it did report selected factors concerning the Nurse Corps at its wartime peak and was conducted at a time midway in the period of this study. The factors selected for comparative purposes were: geographic distribution of nurses before entering naval service; months of post-Pearl Harbor noncontinental duty; and age, rank, and length of service. The factors of age, rank, and length of service in the 1945 survey were compared with similar factors in the patients' histories at the time of admission to the sick list for tuberculosis.

Statistical analysis showed that the differences in age and in post-Pearl Harbor noncontinental duty were not significant. The 1945 survey reported that 48.2 percent of all the nurses were under 25 years of age and that 72.7 percent were less than 30 years of age, as compared with 43 percent under 25 years of age and 76 percent less than 30 years of age in the present study. Seventy-eight percent of all the nurses in the 1945 survey had none or less than six months and 7.4 percent had less than a year of post-Pearl Harbor noncontinental duty, as compared with 79 and 11 percent, respectively, for the patients.

TABLE 5. *Geographic distribution before entering naval service of 100 patients with active tuberculosis compared with 10,063 nurses in 1945 survey*

Geographic location	1945 survey (percent)*	Present survey (100 patients) (percent)
New England	15	11
Middle Atlantic	28	36
Central Atlantic	4	8
Southeast	7	6
Great Lakes	21	18
Midwest	9	6
Southwest	5.5	8
Mountain	3	3
Pacific	7.5	4

*Medical Statistics Division, Bureau of Medicine and Surgery, Department of the Navy.

TABLE 6. *Preservice field of nursing of 100 patients compared with 1945 survey[11] and the 1944 Facts About Nursing[12]*

Preservice field of nursing	1945 survey[11] (percent)	Present survey (100 patients) (percent)	Preservice field of nursing	1944 Facts[12] (percent)	Present survey (100 patients) (percent)
Staff nurses	54	62	Institutional	63	70
Head nurse	20	7	Private duty	17	17
Supervisor	9	9	Public Health	6	7
Private duty	9	17	Industrial	3	2
All other	8	5	Other	4	4
			Unknown	7	-

The factors of geographic distribution before naval service, preservice field of nursing, rank, and length of service were, however, sufficiently at variance to warrant discussion. Table 5 shows that more patients than would have been expected, based on the survey, had resided in the Middle and Central Atlantic States before entering the Navy. Nearly all (92 percent) of the eastern residents were from large cities (100,000 population) where chance contact with tuberculous persons might have occurred more frequently than in less densely settled areas. This factor may be significant but in the 1945 survey it is not available for comparison. In comparison with the 1945 survey, more patients than would have been expected had been private-duty nurses and fewer had been head nurses; but the differences in groups in respect to staff nursing is not more than would occur frequently by chance.

Table 6 compares the preservice field of nursing of the 100 patients, the 1945 survey, and the 1944 *Facts About Nursing*.[12] The 1945 survey of the Nurse Corps was an analysis according to position in the field, whereas the 1944 *Facts About Nursing* was an analysis according to practice and reflected the period when many of the 100 patients in the present study were members of the civilian nurse population.

Two possible explanations for the differences in the percentages of Nurse Corps personnel and 100 patients in the head nurse and private-duty groups are: (1) Because the length of preservice graduate period was less than two years for 61 of the 100 patients, private duty might have been practiced while awaiting the call to active duty; or, (2) in the late thirties and early forties, private duty was still one of the popular fields of nursing practice. The comparison of the 100 patients with the 1944 *Facts About Nursing* shows that patients in this study followed about the same fields of practice as did nurses in general.

When the length of service is considered, it is noted in table 7 that the proportion of patients with less than a year of service is about the same as for the nurses in the 1945 survey, but the proportion of nurses in the 12- to 35-month group is somewhat less and that in the 35- to 59-month group considerably greater. There are fewer patients than expected in the rank of lieutenant, junior grade. Because rank* usually is related to length of service, the differences may have been brought about by the same causes that acted to produce fewer patients than expected in the group with 12 to 35 months of service. The explanation for these apparent differences is not clear.

*Between November 1942 and March 1945 promotions to lieutenant, junior grade, were made using three criteria: length of service, age, and/or academic qualifications. Nurses over 33 years of age with outstanding qualifications and experience and those nurses 30 to 33 years of age with academic degrees were promoted without regard to length of service.

TABLE 7. *Rank and length of service*

Length of naval service	1945 survey[11] (percent)	Present survey (100 patients) (percent)	Rank	1945 survey[11] (percent)	Present survey (100 patients) (percent)
0 - 11 months	32.6	34	Ensign	44.4	52
12 - 35 months	55.2	44	Lieutenant, junior grade	41.3	27
36 - 59 months	9.6	19	Lieutenant	14.3	21
60 and over	2.6	3			

TABLE 8. *Student experience on special clinical services*

Special clinical service	78 nurses in present survey (percent)	NLNE Survey[15]	
		Year	
		1939 (percent)	1943 (percent)
Tuberculosis	33	32	34
Communicable disease	50	56	56
Psychiatry	51	50	54
Outpatient	50	57	58
Public Health	20	32	30

Information concerning the types and duration of clinical experiences, exposures to tuberculosis, and stations of duty for all Nurse Corps personnel was not available for comparison with the 100 patients in this study. The experiences of the patients in this study on special clinical services while student nurses is limited to 78 replies to the questionnaires. The student experiences reported were checked with the 1931, 1935, and 1943 editions of List of Schools Meeting Minimum Requirements[13] and with the 1946 edition of State Accredited Schools of Nursing[14] published by the National League of Nursing Education. In all but one instance, the reports of the patients and the League were in agreement. The student experiences reported were also compared with the report from the Department of Studies of the National League of Nursing Education.[15] The two years of the report, 1939 and 1943, represented the period when most of the patients in this study were student nurses. Table 8 demonstrates how closely the experiences of these patients resembled the common practice at that time.

SUBSEQUENT HISTORY

The 100 patients in this study were classified according to manner of disposition listed in the official records (table 9). Four of the 90 patients listed as retired were those whose disease was detected less than nine months after leaving service and was considered to have been active while in the Navy. One of the nurses released to inactive duty and one of those who resigned are now receiving veterans' pensions for service-connected tuberculosis. In addition to the two patients who died in service, two later died in retirement and one died after release to inactive duty. It must be presumed that the eleven nurses who did not answer the questionnaire are living because they are still being carried on the retirement rolls. The status of five of the

100 nurses is not known; they have had no communication with the Navy since 1944, their current addresses are not available and they are not receiving retirement pensions from the Navy or the Veterans Administration. Information is therefore available in regard to only 5 deaths among the 100 nurses who were diagnosed as having active tuberculosis while in naval service.

TABLE 9. *Disposition of 100 nurses with active tuberculosis*

Disposition	Number
Retired	90
Released to inactive duty	3
Resigned	2
Revocation of appointment	3
Deceased	2

Of the 78 nurses who replied to the questionnaires, 46 reported that they are now married. Seven reported having one child, two reported two children, and one reported having three children. Two of the nurses have married former tuberculous patients.

Forty-nine of the 78 nurses reported that their disease was classified as arrested or inactive and that they have had no further disease activity since separation from service. Fifteen nurses reported reactivation after their disease was considered arrested, but later was once again classified as arrested. Two nurses reported their disease as being classified as still active, and four reported it active and having spread. Eight of the nurses did not report the status of their disease.

Sixty-two of the nurses reported being under medical supervision of a private physician or at a tuberculosis clinic. Three of the married nurses reported medical supervision of the family and one of the three reported that her child had received BCG. Seven nurses reported that they were still receiving pneumothorax or pneumoperitoneum, one reported having had a thoracoplasty and pneumonectomy, and one reported a phrenemphraxis since separation from naval service.

In response to the query as to how they felt at the present time, 29 reported that they felt well, 19 felt well but tired easily, 10 felt fairly well with rest periods during the day, two reported that they were semi-invalids, and two reported being hospitalized. Only seven reported that they felt very well, were not limited in their activities, and were occupied in full-time work or attending

classes. Thirty-one reported being engaged in part-time housework, nursing, or attending classes. The long-term effects of tuberculosis upon the lives of individuals is clearly demonstrated in the reports from these 78 nurses, particularly when it is noted that the majority have now been separated from service for more than five years.

SUGGESTIONS FOR CONTROL

Forty-five of the 78 nurses offered the following suggestions which they thought might aid in control or prevention of tuberculosis among Navy nurses:

Suggestion	*Number of nurses offering suggestion*
In-service personnel education	11
Roentgenograms of the chest every 3 months for personnel on tuberculosis and chest wards	8
Roentgenograms of the chest every 6 months for all nurses	7
Standardize precaution technics on tuberculosis wards	7
Provide better follow-up studies for tuberculosis contacts	4
Limit assignment to tuberculosis wards to 3 months	4
Roentgenograms of the chest of all admissions	4
Institute precaution technic for chest wards	4
Provide 40-hour workweek	4
Provide a patient-education program	4

Of the 11 nurses who suggested personnel education, eight remarked that they wished they had been instructed in tuberculosis nursing before being assigned to tuberculosis wards. Four of the 11 who suggested personnel education also suggested patient education. It was noted that these four had been hospitalized in private tuberculosis hospitals after separation from service and stated that they realized the value of education in the control and prevention of tuberculosis. Of the seven who suggested standardization of technics in tuberculosis wards, four stated that they realized there was no definite proof of the value of masks, but that the tuberculosis hospitals in which they had been patients or had visited used masks when in close contact with patients.

SUMMARY AND CONCLUSIONS

During the 10-year period, 1941-1950, 100 Navy nurses were admitted for treatment of active tuberculosis. The histories of the patients were reviewed and the findings compared with information available in nursing surveys published during the period. In general, the patients had about the same student nursing, postgraduate, and naval experiences as the nurses in the surveys. Although exceptions were noted in respect to postgraduate experience, state of residence prior to entering naval service, and rank and length of service, no consistent pattern of factors was noted that would identify the patients as a group in which tuberculosis would be more apt to occur than in nurses in general.

Although most of the cases were officially accepted as incurred while on active duty, the medical evidence that infection had occurred during naval service was not convincing. Contact with tuberculous persons was reported almost as frequently before as after entering naval service. In 29 instances in which the preservice roentgenogram of the chest was available for review, 12 contained suspicious shadows and three were technically unsatisfactory. In six other cases, histories of previous illnesses that might have been cause for rejection under regulations current at the time of appointment were given at the time of entering naval service. The general lack of periodic tuberculin testing of nurses either before or after entering the Navy added to the difficulty of arriving at any decisions concerning the time or place in which infections were acquired. Opportunity to significantly lower the incidence of tuberculosis among Navy nurses exists in reducing to a minimum the number of persons accepted for active duty whose medical histories and chest roentgenograms reveal disqualifying evidence of tuberculosis.

This review re-emphasized the hazard to medical personnel of acquiring tuberculosis during their training and postgraduate years and the necessity for constant attention to communicable disease precautions, in-service personnel education, routine tuberculin tests and chest roentgenograms, and careful medical observation of known tuberculosis contacts.

The current requirement for routine periodic tuberculin testing of medical department personnel on duty in naval hospitals, with careful follow-up studies of persons whose tests convert to positive, and for routine chest roentgenograms before, during, and after assignment to wards where tuberculosis patients are cared for, are steps which should result in locating some of the sources of infection within the naval service. The consistent trend toward better health programs for nursing personnel noted during the period of study should result in lower disability rates for nurses in the future.

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Tea, Coffee, Alcohol, and Tobacco

The most important items in the social pharmacopoeia of today are the stimulants tea and coffee, the depressant alcohol, and the mild analgesic tobacco. These are prescribed and dispensed on a vast scale by people who have no knowledge of their pharmacologic action. Dosage is decided empirically in a way which might have more serious results were it not that man's body is in some ways wiser and more experienced than his mind. All these socially prescribed drugs have pleasant and apparently beneficial effects in suitable doses; all of them can have harmful effects when wrongly used.

—I. F. BECK
in *Lancet*, p. 392, Aug. 22, 1953

COARCTATION OF THE AORTA

HAROLD A. LYONS, *Commander, MC, USN*

A GREAT deal concerning coarctation of the aorta has appeared in the literature over the past several years, probably because of the stimulation given to the problem by the marked advances in vascular surgery. Gross,[1] Gross and Hufnagel,[2] and Crafoord and Nylin[3] independently described the surgical correction of this congenital abnormality and gave impetus to the study of the recognition and other features of the condition.

That cases are still being unrecognized is realized from the large number that are discovered routinely in hospital patients undergoing care and treatment for unrelated conditions or supposed hypertensive cardiovascular disease. The problem remains a large one in the military services because the condition in persons entering the service escapes recognition and remains undiagnosed even when the patient is being treated for the various symptoms that are produced. If the condition is recognized, it may be corrected surgically, thereby salvaging the patient for the service, benefiting him by the prospect of long life and relief of symptoms, and minimizing the necessity of prolonged government pension payments.

The number of physical examinations and hospitalizations which these patients have undergone without detection of the abnormality indicates the frequency of failure to recognize it. These facts are expressed in tables 1 and 2.

This congenital abnormality has been described in many previous articles.[4-6] Briefly, it is a narrowing of the aortic arch sufficient to obstruct the flow of blood. This constriction usually occurs just distal to the left subclavian artery and may appear as an angulated continuation of the aorta. Edwards and coworkers[7] demonstrated that the constriction is mainly a peculiar invagination of the aortic wall and is more marked than the outside wall would indicate (fig. 1). The media turns in at this point to form a diaphragm, with the remaining small opening at the caudal or concave portion of the arch. It is this, the adult type of coarctation, which concerns us. The constriction is sometimes

From U. S. Naval Hospital, Philadelphia, Pa. Doctor Lyons has resigned from the Navy and is at State University of New York College of Medicine at New York City.

TABLE 1. *Physical examinations and hospitalizations before detection of coarctation of the aorta*

Patient	Number of physical examinations	Number of hospitalizations	Years of service
1	5	0	8
2	12	4	10
3	10	3	7
4	6	1	8
5	6	2	3
6	18	4	22
7	23	5	31
8	3	0	0
9	4	1	0
10	2	0	0
11	3	1	3
12	2	0	0
13	3	1	2

TABLE 2. *Age of patient when diagnosis of coarctation of the aorta was made*

Patient	Age (years)
1	18
2	20
3	19
4	32
5	22
6	58
7	53
8	15
9	30
10	26
11	19
12	22
13	21

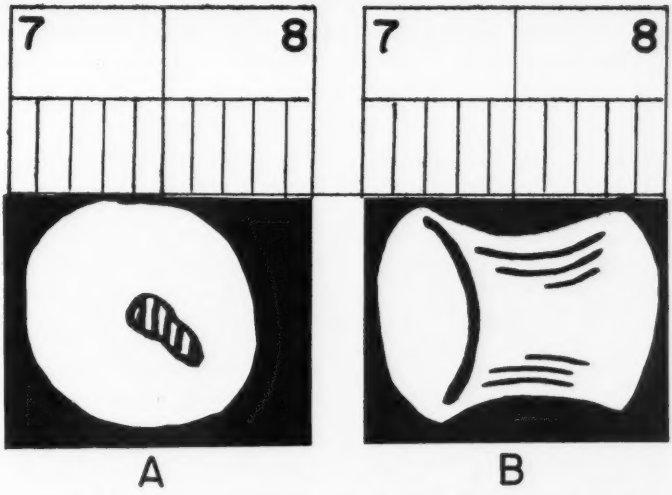

Figure 1. Sketches of an actual surgical specimen of the coarcted segment of an aorta removed from one of the patients. (A) *Cross-section view.* (B) *Longitudinal view. Note the small lumen in* (A), *which measures only 0.3 mm.*

at the subclavian artery or occasionally above it. This last has been called the infantile type. Usually the obstruction, for practical purposes, is complete, as indicated by pathologic studies.

PHYSICAL EXAMINATION

The diagnosis is usually evident if the simple procedure of *palpation of the femoral arteries* is carried out. Diminished or absent pulsations of the femoral arteries should arouse suspicion. It is stated that Sir Thomas Lewis, after learning of the condition while visiting in this country, returned to England and by re-examining the hypertensives in his clinic with palpation of the femoral arteries discovered a goodly number of patients having a coarcted aorta. Hypertension in the upper extremities, especially that occurring in a young person, indicates the need for examination of the femoral arteries for reduced pulsations. The hypertension may not be great. Some of the cases reported here and elsewhere exhibited systolic pressures in the upper extremities of only 135 to 145 mm. Hg. When simultaneous hypotension is discovered in the lower extremities, the diagnosis is practically certain.

Pulsating collateral vessels, either visible or palpable, in the interscapular area, in the anterolateral regions of the chest, in the area below the breasts, or in the superficial epigastric region will, if present, be helpful in making the diagnosis. A systolic

murmur at the base of the heart will provide an added indication. Most commonly it is of moderate intensity. Every patient included in this report exhibited such a murmur, but it is sometimes absent. It must be remembered that the murmur may arise not in the aorta but in the dilated collateral channels, especially the internal mammary arteries. Sometimes a diastolic aortic murmur is also heard, indicating the possibility of a bicuspid aortic valve. This coincident congenital anomaly has been reported in from 15 to 20 percent of the patients with coarctation of the aorta. A diastolic murmur on occasion may represent some other type of aortic valvular disease or, if in the mitral area, indicate associated mitral valvular disease. The systolic murmur may be heard over the entire precordium with its maximum intensity at the base. In many patients it radiates to the back and may be heard in the interscapular area.

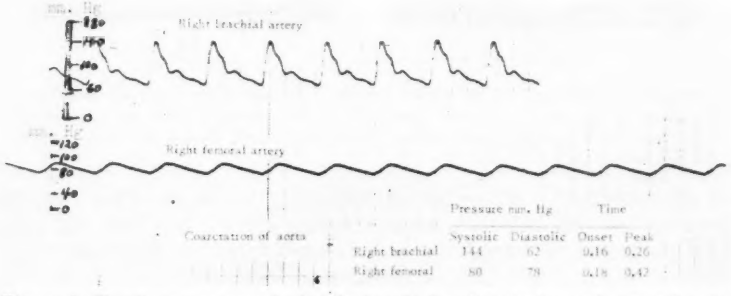

Figure 2. Simultaneous record of right brachial and right femoral arterial pulse made by direct method. Note the plateau contour type of record obtained from the femoral artery, the delayed peak, and the low pressure during systole. Diastolic pressure remains unreduced in the femoral artery.

When the murmur arises in the collateral vessels it usually is continuous in character, being accentuated during systole and minimal during diastole. A patent ductus arteriosus may also give rise to the continuous type of murmur. Two of our patients (9 and 11) had this associated condition. It has been reported by Abbott and others to occur in about 10 percent of the patients with coarctation of the aorta.

Direct femoral arterial pulsations in all the patients showed a typically slow rise of the peak at systole. Figure 2 illustrates an example of this finding. It is primarily this slow rise which accounts for the difficulty in palpating the pulse in the femorals. It is a clinical sign that may aid in making the diagnosis, and can be recorded in the ordinary hospital heart station or practitioner's office by means of the usual gelatin pulse capsule and electrocardiographic timing of the onset and peak of the systolic waves of both the brachial and femoral arteries. If it is

found when the measurements are compared that the femoral times are delayed, the presence of a coarctation of the aorta may be assumed.

In some patients there may be signs of differences in circulation to the arms, demonstrated by smaller pulses and lower blood pressures. These signs appear more commonly in the left arm because the constriction is frequently located proximal to the origin of the left subclavian, but they may appear in the right arm if there is stenosis of the origin of the right subclavian artery.

Auscultation of the head may reveal a bruit indicating the presence of a cerebral aneurysm, which is a frequent associated congenital anomaly. The retina may show the usual vascular changes of hypertension (nickings and hemorrhages) or very tortuous arterial vessels. Some believe that this extreme degree of tortuosity is characteristic of coarctation of the aorta. Subarachnoid hemorrhage is another cerebral episode which may occur. It has been noted that systolic, diastolic, and pulse pressures tend to be highest in those patients who die from a cerebral episode. In a few cases there is increased blood flow in the upper part of the body, and one may find prognathism, overdevelopment of the upper as compared with the lower extremities, unusually warm hands, and high facial coloring.

SYMPTOMS

Symptoms may be absent, especially in children and adolescents when the degree of the constriction of the aorta is not extreme. These may develop the usual symptoms of hypertension, however, exhibiting flushing, headaches, epistaxis, and pounding sensations in the head. The pounding sensations may be accentuated by stooping or bending. Coldness, pallor, and numbness of the legs and feet are frequent complaints. Pain and intermittent claudication may be present. Weakness of the legs, sometimes marked, may be a prominent complaint. When there is an obstruction of one of the subclavian arteries, coolness, pallor associated with numbness, and tingling are present.

Back pain if constant and prominent may be a bad prognostic sign indicating an impending dissection of the aorta.

ROENTGENOLOGIC FINDINGS

Often it is only because of abnormal roentgenographic findings that investigation of the patient is initiated, but even these abnormalities have not been recognized in the patients reported on in this article. The best known roentgenographic findings are the notching of inferior portions of the rib, originally described by Railsback and Dock.[4] Notching of the ribs stands out as a very characteristic and almost pathognomonic finding. In the

patients reported here, however, it was not frequently seen. Other conditions that may produce notching of the ribs are neurofibromatosis, pulmonary arteriovenous fistulas, engorged intercostal veins, severe pulmonary artery stenosis, aortic valvular disease, tetralogy of Fallot, obstruction of superior vena cava, and vascular malformation of the thoracic wall. It has been reported that notching is absent in about 15 percent of the cases. It may be

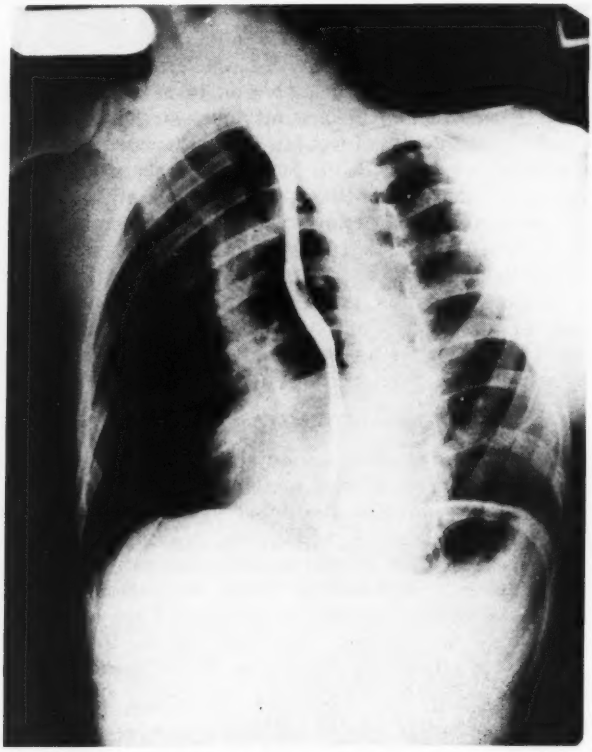

Figure 3. Left anterior oblique chest roentgenogram of patient 11, showing clear aortic window and characteristic deviation of esophagus.

easily overlooked, and if the stenosis of the aorta is not severe enough to cause the development of large collateral vessels, it may never occur. Theoretically, it should result only after several years of hypertension; however, it has been reported by Pugh[9] in an eight-year-old child and by Neuhauser[10] in a nine-month-old baby.

Other signs seen in the roentgenogram of the chest are concerned with the aortic knob. A common roentgenographic finding

is the presence of an abnormal knob shadow. The knob may lack prominence, or dilatation or bilobulation may be seen. The bilobular appearance may be the result of the poststenotic dilatation of the descending aorta. This poststenotic abnormality may also cause a characteristic deviation of the barium-filled esophagus (fig. 3). Occasionally a visible notch is seen in the aorta. This is a sign which has been previously described but which recently

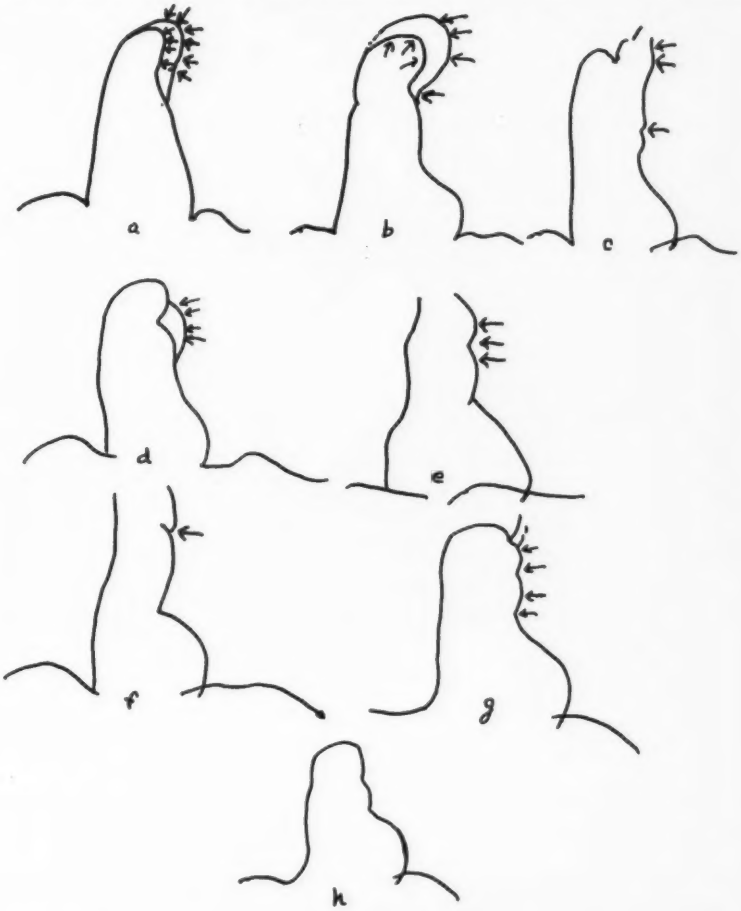

Figure 4. Diagrammatic sketches of abnormalities of the aortic contour made from actual tracings of roentgenograms. (a and b) *Double knob contour.* (c) *Dilated left subclavian artery and notching along descending aorta.* (d) *Shadow produced by poststenotic dilatation of descending aorta.* (e, f, and g) *Notching and identations of descending aortic shadow.* (h) *Absent aortic knob.*

has received re-emphasis by Bruwer and Pugh.[11] In the left anterior oblique view an unusual clearness of the aortic window is seen. Left ventricular enlargement as a result of the hypertension is usually present. Dilatation of the left subclavian artery may be a prominent feature. On fluoroscopic examination this vessel may be observed to have greatly increased pulsations. Because of this finding of a prominent, dilated, left subclavian artery, one of our patients (No. 7), 56 years of age, was admitted with the diagnosis of a mediastinal tumor. The ascending aorta may be seen on conventional roentgenograms to be dilated. This

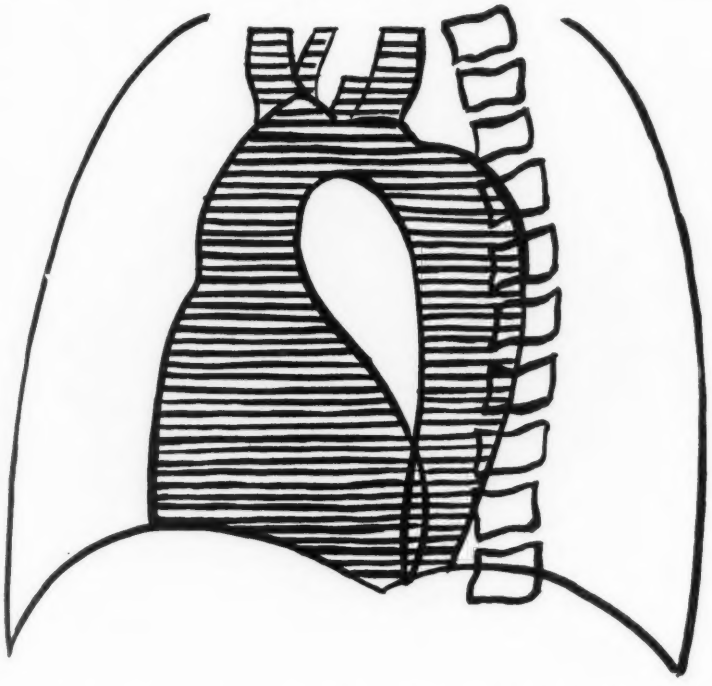

Figure 5. Diagram of left anterior oblique chest roentgenogram of one of the patients illustrating the large aortic window and the dilated descending aortic shadow.

may be merely an additional finding. Figure 4 shows diagrammatic sketches of these abnormalities of contour made from tracings of roentgenograms. Figures 5 through 9 illustrate other findings. Table 3 is a tabulation of the physical findings and other features discovered in each case.

The most valuable method for accurately outlining the point of aortic constriction is angiocardiography as described by Robb

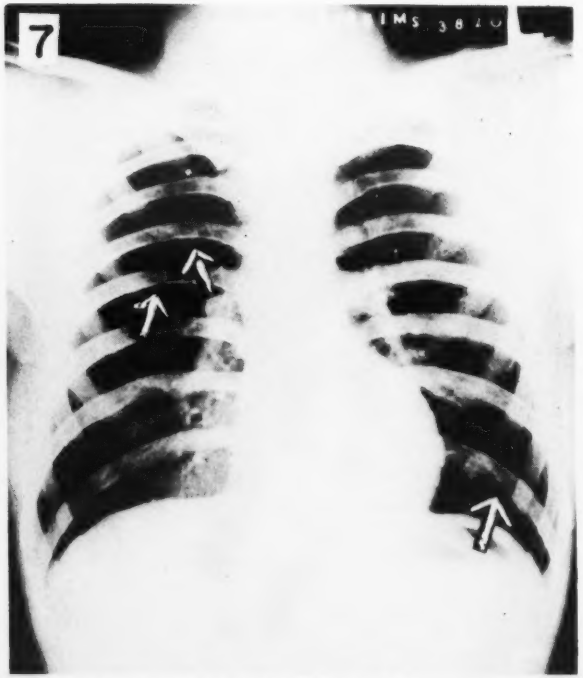

Figure 6. Posteroanterior roentgenogram of the chest of patient 8 showing the double aortic shadow. Figure 7. Posteroanterior chest roentgenogram of patient 11 showing small aortic knob and notched ribs indicated by arrows.

Figure 8. Angiocardiogram of patient 7 showing dilated left subclavian artery, constricted segment just distal to this, dilated descending aorta, clear aortic window, and enlarged left ventricle. Figure 9. Left anterior oblique angiocardiogram of patient 8 showing constricted segment and dilated descending aorta. Note absence of left ventricular enlargement.

...with the dilated descending aorta. Note absence of left ventricular enlargement.

TABLE 3. *Physical and roentgenologic findings confirmed by angiocardiography*

Patient	Enlarged left subclavian artery	Abnormal aortic contour	Notched ribs	Left ventricular hypertension	Systolic basal murmur	Diastolic murmur	Hypertension in upper extremities	Hypotension in lower extremities	Visible collaterals	Palpable collaterals
1	0	+	+	+	+	0	+	+	0	0
2	0	0	0	+	+	0	+	+	0	0
3	0	+	+	+	+	0	+	±	0	0
4	0	+	0	0	+	0	+	0	0	0
5	0	+	0	+	+	0	+	+	0	0
6	0	+	+	+	+	0	+	+	+	+
7	+	+	0	+	+	0	+	+	0	+
8	0	0	0	+	+	0	+	±	0	0
9	0	+	0	+	+	+*	+	+	0	+
10	0	0	+	+	+	0	+	+	0	0
11	0	0	0	+	+	0	+	+	0	0
12	+	0	+	+	+	0	+	+	0	0
13	0	+	0	+	+	+*	+	+	0	+

*This murmur arose from a patent ductus arteriosus.

and Steinberg.[12] Even though Gross[13] has not found this method satisfactory, it is still the best and safest method and affords excellent visualization when the technic is highly developed. It is indispensable in the examination of any patient likely to undergo surgery for coarctation of the aorta because: (1) exact anatomic localization of the site is achieved, (2) information regarding hemodynamic consequences is given, (3) the surgeon is provided with the data he needs for planning the operation, (4) it indicates whether an arterial graft will be required, and (5) the usual type of coarctation of the aorta can be distinguished from the unusual one located in the descending aorta. The findings found on angiocardiography have been adequately described by Dotter and co-workers.[14]

OTHER CONSIDERATIONS

There are all degrees of coarctation of the aorta. The majority represent for all practical purposes complete occlusion, but there are a few with positive roentgenologic and angiographic findings

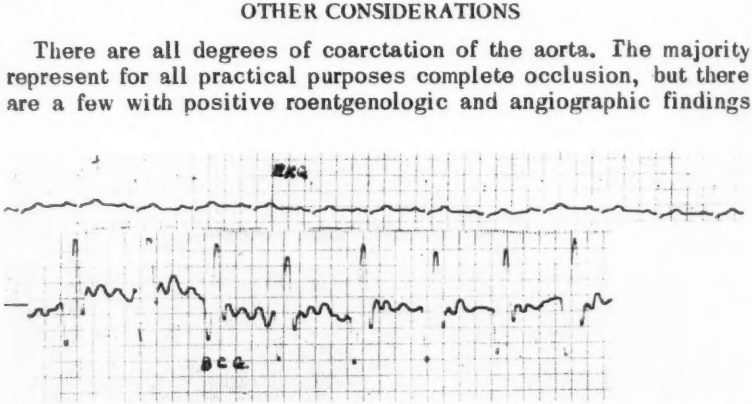

Figure 10. Ballistocardiogram showing short J-K segment, which was present in all of our patients, and which is a characteristic finding in coarctation of the aorta.

in which the blood pressure in the legs is either normal or only slightly reduced and that in the upper extremities is either normal or only slightly elevated. These are incomplete or subclinical coarctations, of which a report will be submitted at a later date. The electrocardiogram, if it exhibits any abnormalities, will represent the left ventricular effects resulting from the hypertension. The ballistocardiogram characteristically shows a shortened J-K segment (fig. 10). It is the postoperative changes of the K wave toward normal and the blood pressure lowering that are indications of the successful surgical result.

SURGICAL CORRECTION

The surgical technic and considerations are well established since the original operations by Crafoord and Nylin and Gross and Hufnagel. Older patients are generally unsatisfactory subjects for operation because of the greater frequency of sclerotic changes

of the vessel walls, but Sealey[15] has successfully operated on a 56-year-old male. Although the most desirable age appears to be in the second decade, excellent results are obtainable in the 20- and 30-year age groups. One of our patients who was operated on was 34 years of age, and a good result was obtained. Very young children are also poor subjects because the aorta is small and the collateral vessels are not well developed, adding greatly to the risk of the operation. The possibility of the anastomotic site failing to enlarge with the growth of the child is also a potent deterrent factor. Advanced cardiac enlargement, myocardial damage, and decreased cardiac reserve all add to the risk of operation, but after medical management are not contraindications. Hypertension, no matter of what degree, does not disqualify a patient for an operation, although if it is of long standing and in a patient over 20 years old, it certainly will increase the risk because of the changes in the aortic wall which may have resulted.

The results of surgical intervention are dramatic, although it may take a month for the blood pressure to return to normal levels. The femoral arterial pulses return to near or normal when the operation has been properly performed. If early diagnosis is made there is little doubt that the patient will be benefited by surgical treatment. The age group of the military services offers a fertile field for discovering patients with coarctation of the aorta who can be benefited by surgical means. Patient 5 was an Army hospital corpsman who had a satisfactory operative result and who has just returned from a two-year tour of combat duty in Korea. He is now four years postoperative. It is firmly believed that those who have this congenital abnormality surgically corrected may be salvaged for continued duty within the service, bringing benefit to the government by keeping trained men in their positions and avoiding untold pension costs, as well as bestowing benefits to the patient by freeing him of symptoms and providing for a longer span of life. The average age at death of persons with untreated coarctation of the aorta is 30 to 39 years.

SUMMARY

Thirteen cases of coarctation of the aorta, diagnosed after the patients had undergone a number of physical examinations and, in a few, previous hospitalization, illustrate the frequency with which the detection of the abnormality is missed on physical examination.

Diminished pulsations of the femoral arteries, with hypertension in the upper extremities and hypotension in the lower extremities, are of particular diagnostic value.

Early detection and surgical correction are necessary if the patient is to enjoy long life, be symptom-free, and is to continue duty in military service.

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Pioneer in Cardiac Physiology

Among the pioneers of the study of the circulation we should also pay our respects to Stephen Hales who in 1733 made casts of the left ventricular cavity and, assuming that each stroke emptied it, calculated to four figures the cardiac output, and the velocity of the blood flow in the aorta and in its branches by dividing the output by the aggregate cross area of the arterial tree at various levels. He located the peripheral resistance—to use modern jargon—in the minute vessels and worked out an explanation for dropsy that needs little extrapolation to seem very modern.

—W. F. HAMILTON, Ph. D.
in *Circulation*, p. 527, Oct. 1953

CHOREA ASSOCIATED WITH HYPERTHYROIDISM

Review of the Literature and Report of a Case

JAMES C. SYNER, *Captain, MC, USA*
PAUL S. FANCHER, *Colonel, MC, USA*
JOHN W. KEMBLE, *Colonel, MC, USA*

IN the conventional scheme of categorizing varied patterns of involuntary muscular movements of a purposeless to a quasi-purposive nature, there is described the so-called extrapyramidal syndromes.[1] These are the clinical manifestations of pathologic changes in the corpus striatum and have as a common denominator some form of involuntary muscular movements, particularly of the extremities.[1,2] The extrapyramidal syndromes consist of the following: (1) Parkinsonian syndrome, subclassified into (a) paralysis agitans, (b) parkinsonism following encephalitis lethargica, and (c) arteriosclerotic parkinsonism. It is characterized by slow, rhythmical movement, muscular rigidity, and tremor. (2) Hepatolenticular degeneration, which is a progressive disease of early life, frequently familial, with central nervous system degeneration, cirrhosis of the liver, and increasing muscular rigidity and tremor. (3) Torsion dystonia, characterized by involuntary movements producing torsion of the limbs and vertebral columns. (4) Spasmodic torticollis, causing a rotated attitude of the head, induced by clonic or tonic contraction of the cervical muscles. (5) Athetosis, with involuntary movements which are slower, coarser, and more writhing than choreic movements. (6) Chorea, subclassified into Sydenham's, Huntington's, and senile chorea.[1]

CASE REPORT

This case report illustrates a disease process in which chorea, or choreiform movements, occurred in a patient with severe hyperthyroidism, and is of particular interest because of its rarity as well as its value in implicating chorea as a manifestation in conditions other than rheumatic fever.

From Walter Reed Army Hospital, Washington, D. C. Capt. Syner now at 48th Surgical Hospital.

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A 25-year-old woman was transferred from another hospital with a diagnosis of chorea, cause unknown. She was a German war bride who had been in this country less than one year. Her husband was overseas, and there had been increasing nervousness, irritability, and unresolved conflict in her social and marital adjustment. Two weeks prior to admission there was an abrupt onset of continuous, involuntary flinging movements of the extremities which were more pronounced on her left side. Emotions were labile but no bizarre ideation was expressed. She cried or laughed without apparent cause and she had fallen on several occasions because of the weakness and unsteady gait associated with the purposeless flinging movements.

She had a slightly enlarged thyroid gland and a slight degree of exophthalmos. Her pulse rate varied from 108 to 130 per minute. A soft systolic murmur without radiation (grade I intensity) was heard in the second left intercostal space.

Routine laboratory data was without significant abnormalities. Sedimentation rate was 8 mm. in one hour and remained normal throughout the hospital course. The spinal fluid was normal and the electrocardiogram was also within normal limits.

The hospital course presented a continuation of the choreiform movements and wide mood swings. Consultations were obtained from several specialists, all of whom believed that the patient had chorea as a manifestation of rheumatic fever.

The basic therapeutic approach consisted of sedation. A course of intravenous typhoid fever therapy was also given, and it was the clinical impression that improvement was noted in both the diminution of the choreiform movements and the stabilization of the emotional complexes. Several days after completion of the fever therapy the patient developed a psychosis with ideas of persecution. She accused ward personnel of making sexual advances, refused to leave the bathroom, and was alternately manic and depressive. She was transferred to the neuropsychiatric service where the problem was approached with continuous sedation and therapeutic interviews. An electroencephalogram was not satisfactory but no abnormalities were apparent. With adequate sedation, rest, quiet, and periodic interviews the patient showed some improvement and was discharged from the hospital.

Upon her return home and discontinuance of the regular sedation schedule, the patient had a recurrence of her previous purposeless extremity movements and wide mood swings. She visited a physician in her community who made a diagnosis of hyperthyroidism and referred her back to this hospital for further study and treatment.

Her basal metabolic rate was plus 86 percent. Radioactive iodine uptake was 86.6 percent. Therapy consisting of propylthiouracil and Lugol's solution was instituted. At the beginning of the therapy the patient was severely toxic. She demonstrated gross tremor, lid lag, extreme irritability, weight loss, nervousness, frequent crying, and her pulse continued around 120 per minute. At the end of the first month of therapy her basal metabolic rate was plus 7 percent, she was cheerful, socialized well with her friends, and her pulse dropped to 76 per minute. The gross tremor of the hands disappeared, her wide mood swings cleared, and she gained 17 pounds.

DISCUSSION

The clinical manifestations of the neuromuscular disorder in this patient meets the established criteria of Sydenham's chorea by reason of: (1) its distinctive involuntary movements; (2) movements which are purposeless to quasi-purposive; (3) movements intensified by voluntary effort and by excitement; (4) movements that disappear during a period of sleep; (5) absence of sensory changes with no disturbance of the sphincters; (6) associated presence of a marked emotional instability and a state of excitement which can progress to a distinct maniacal chorea; (7) absence of progressive mental deterioration; and (8) transient nature of the symptoms.[2-5]

Huntington's chorea, a heredodegenerative disease of the nervous system, differs from Sydenham's chorea. Huntington's chorea is characterized by a progression of the symptoms and mental deterioration, and usually appears late in life.[1,2,6,7] There were no features in this case to suggest this diagnosis.

Recognition of senile chorea should present no difficulty in differentiation from Sydenham's chorea because of the age of the patient, suddenness of onset of symptoms, and its generally unilateral nature.[1,3,4,8-10] It may be difficult, however, to differentiate senile chorea from Huntington's chorea.

In evaluation of the etiology of chorea in this study, one of the major factors considered was rheumatic fever. Rheumatic fever as the cause of Sydenham's chorea, especially in childhood, is well documented.[1,3-5,11-16] Unfortunately most of the information on chorea as a manifestation of rheumatic fever applies to the pediatric age group. Kuttner[17] stated that chorea is rare after puberty and never occurs after the age of 20 years in association with rheumatic fever. This is further illustrated in a series of cases analyzed by Jones and Bland[18] who pointed out that chorea in rheumatic fever is rarely seen after adolescence. This point is also indicated in Hedley's[19-21] series of cases. Jones[12] and Jones and Bland[18] also stressed the im-

portance of a previous history of chorea in establishing the diagnosis of rheumatic fever in adults. Therefore, although Jones suggested that chorea is a major manifestation of rheumatic fever, this would seem to apply only to a well-defined age group, and particularly to ages from 7 to 14 years as given by Kuttner, with a peak incidence at 8.

There are many other diseases which have been associated with chorea. A review of the literature revealed that chorea has been described in diphtheria, benign tertian malaria, psychic disturbances, murine typhus, measles, scarlet fever, influenza, disseminated lupus erythematosus, syphilis, pregnancy, polycythemia vera, anemia, and chickenpox.[1, 3, 22-27]

Another point of interest in this case was the evaluation of the normal erythrocyte sedimentation rate relative to the diagnosis of rheumatic fever. The elevated sedimentation rate has long been used as an aid in following rheumatic activity. However, it is generally accepted that the sedimentation rate is not a specific diagnostic factor, but rather a nonspecific finding suggestive of active disease processes. Many authors have pointed out the presence of a normal sedimentation rate in the presence of clinical active rheumatic fever.[12, 17, 18, 22, 23, 28, 29] Kuttner stated that patients with chorea usually do not have fever, leukocytosis, or a rapid erythrocyte sedimentation rate when rheumatic fever is the causative factor. Jones stated that the sedimentation rate may be normal in active rheumatic fever and that a normal rate in the presence of rheumatic heart failure is frequently found.

Kagan and Mirman[23] analyzed a series of 107 patients for the specific purpose of obtaining further information on the relationship between an increased erythrocyte sedimentation rate in active rheumatic fever versus the normal sedimentation rate in chorea. They studied the difference between patients with chorea who had increased sedimentation rates and those with chorea who had normal sedimentation rates. Of the 107 chorea patients, 88 were seen during the first episode of chorea and 19 were seen for the first time during the second or subsequent episode. Of the 88 patients, 51 had a normal sedimentation rate, and not one of these showed any other evidence of rheumatic fever. Fifteen of these patients were observed for from 5 to 11 years and during that time none developed rheumatic fever. The remaining 37 patients had an increased sedimentation rate; 19 had active rheumatic heart disease; 12 showed other evidence of rheumatic fever; and 6 had no other evidence of rheumatic fever. The authors concluded that chorea associated with an increased erythrocyte sedimentation rate is in most instances a manifestation of active rheumatic fever. It was their opinion that patients who had a normal sedimentation

rate during their first episode of chorea did not have rheumatic fever. In this nonrheumatic chorea group it was shown that psychogenic factors were far more numerous and varied than in the patient with rheumatic chorea. On detailed case analysis they implicated a temporal relationship between the onset of the choreic episode and the striking nature of certain psychogenic factors. This emphasized the probable etiologic role of psychic disturbance in chorea.

Information on the independence of chorea and rheumatic fever is not new and is supported by other workers. In 71 patients with chorea, Johnston[28] found 59 percent without other evidence of rheumatic fever. Sutton and Dodge[30] reported on 466 choreic patients in whom 52 percent had no other evidence of rheumatic fever. Coburn and Moore,[31] reporting on 137 hospitalized choreic patients, noted that 49.7 percent were without other evidence of rheumatic fever. Parrish and colleagues[32] reported on 112 choreics in whom 69.7 percent had no other evidence of rheumatic fever. In the Gerstley et al.[29] series of 150 patients with chorea, 86.7 percent were without other evidence of rheumatic fever.

The problem of effect of chorea on the basal metabolic rate must be considered. Lueth[33] studied 42 patients with acute Sydenham's chorea and found the basal metabolic rate in each patient to be normal. He further pointed out that the severity of chorea apparently did not effect the metabolic rate. Gerstley[34] studied this problem and found in his series of cases that the basal metabolic rate was within normal limits.

In a review of the literature and a number of standard textbooks on neurology and endocrinology, only slight reference was made to the association of chorea in hyperthyroidism. Brain,[1] in his discussion on the etiology of chorea, mentions that thyrotoxicosis is a rare cause of the syndrome. Lueth described a patient with irregular tremor, tachycardia, soft systolic murmur over the apex of her heart, moderate pyrexia, slight loss of weight, and irritability, in whom it was difficult to distinguish between an acute rheumatic chorea and a thyrotoxicosis. He stated that other patients have been observed where this differential diagnosis arises. Bing[35] observed choreiform movements in one patient with thyrotoxicosis but stated that he considered them to be "nothing more than an exaggerated form of psychomotor restlessness."

SUMMARY

An associated chorea may mask or delay the recognition of clinical hyperthyroidism. Such a case associated with severe thyrotoxicosis is reported. This patient had none of the manifestations of acute rheumatic fever or rheumatic heart disease

and was similar to those described by Kagan and Mirman.[23] His analysis suggested that patients who had a normal sedimentation rate during their first episode of chorea did not have rheumatic fever. In the nonrheumatic chorea, psychogenic factors were far more numerous and varied than in the cases of rheumatic chorea. The persistent normal erythrocyte sedimentation rate and associated psychogenic features suggest a nonrheumatic cause. Evidence that a normal basal metabolic rate is the rule in Sydenham's chorea is found in Lueth's[33] study. A diagnosis of thyrotoxicosis was well established in our patient by clinical and laboratory findings and the patient showed a prompt response to propylthiouracil and Lugol's solution.

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The physician had best avoid telling his patient to stop worrying. The patient would be only too happy to do this if he could. He cannot do it voluntarily, and many patients will resent such advice from family, friends, or physician.

—HENRY. P. LAUGHLIN, M. D.
in *Medical Annals of the District of Columbia*, p. 472, Sept. 1953

TYPHOID FEVER EPIDEMIC INVOLVING IMMUNIZED SOLDIERS

ALI IHSAN BALIM, *M. D.*

CHRISTIAN GRONBECK, Jr., *Lieutenant Colonel, MC, USA*

SCATTERED cases of typhoid fever in previously immunized personnel have been reported by Hodgson,[1] Tullis,[2] Syverton and associates,[3] and Rosenblum.[4] The largest single outbreak reported is that of Syverton and associates with 24 cases and Rosenblum with 17 cases from the same outbreak which were reported separately. The source of the infection was not definitely ascertained in these series, and the pattern of cases both geographically and in time was of an endemic rather than epidemic type. The present series of 112 cases is considered worth reporting because of its size and typical epidemic form.

All cases occurred in Turkish army personnel, members of one regiment stationed in the same camp in eastern Turkey. All patients were hospitalized between 8 September 1952 and 2 October 1952. Fifty of the 112 patients were treated at one military hospital on the service of one of us (A. I. B.). Detailed information on the other 62 patients is not available to us, so this report will be confined to the 50 patients observed. In general, the 112 patients followed the same pattern of disease, treatment, and results. There were no deaths.

The regiment involved in this epidemic was stationed in a rural, isolated area in rather crowded barracks. Typhoid was endemic among the civilian population. A small stream flowing through the camp was used for drinking water. The epidemic is presumed to have started by carrier-contamination of this stream. One soldier returned from leave on 22 August, 15 days before the start of the epidemic. In an investigation into the cause of the epidemic, this soldier was found, by stool culture, to be a typhoid carrier, and it was then learned that he had had prolonged fever and had been treated with chloramphenicol during

From Dumlu Turkish Army Hospital, Yalvac, Turkey. Col. Gronbeck is Surgeon, 28th Infantry Division.

his leave. He is assumed to be the source of the water contamination, but this is not certain because 50 other typhoid carriers, who had evidently been carriers for months and years, were discovered in the regiment during the investigation. Forty of these were cured of their carrier state by a combination of sulfanilamide

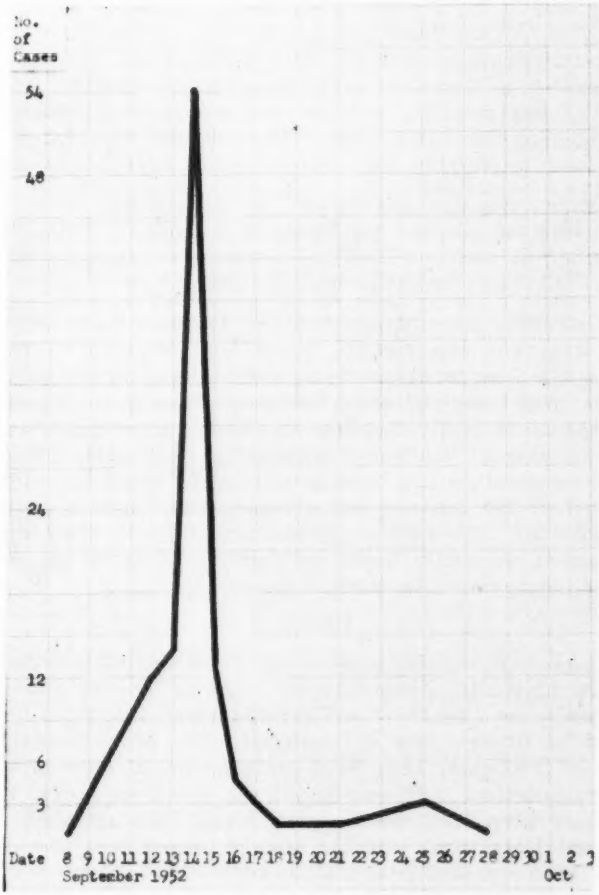

Figure 1. Time distribution of occurrence of typhoid fever among the troops.

or sulfaguanidine and chloramphenicol. The ten who remained carriers were segregated. The time distribution of the cases indicates a water or food source (fig. 1), but food as the source is unlikely because the cases occurred simultaneously in companies with different kitchens.

On entering military service, all Turkish soldiers are inoculated against typhoid, typhus, and smallpox. A mixed typhoid-typhus vaccine containing 500,000,000 typhoid bacilli and 250,000,000 each of paratyphoid A and B per cc. of vaccine, prepared in Turkish government laboratories, is used. A course of immunization consists of inoculation of 0.5 cc. of the vaccine initially and 1 cc. a week later. The U. S. Army vaccine contains 1,000,000,000 bacteria per cc. and the initial course is three inoculations of 0.5 cc. each. This gives a total of the same number of bacteria as in the Turkish method. After the epidemic, samples of the vaccine used to immunize these soldiers were recalled for examination. The vaccine was found to be sterile and to contain the proper number of bacteria per cc.

The diagnosis was established in all patients by a characteristic clinical picture, confirmed by a positive Widal reaction in dilutions greater than 1:200. Cultures were not done routinely because laboratory facilities were limited.

Most patients were observed in the hospital for a day or two before treatment was started, but a few seriously ill patients, in whom the diagnosis was clear, were treated on admission. All patients with uncomplicated disease were given 2 grams of chloramphenicol orally the first day and 1 gram daily thereafter in divided doses. This was continued for a minimum of four days, or until temperature had been normal for 24 hours and signs and symptoms of the disease had disappeared. These patients can be subdivided into several groups according to their response to treatment, primarily based on duration of fever and clinical signs and symptoms after start of treatment.

GROUP 1

Eight patients became afebrile and almost asymptomatic within 24 hours. Clinically, these patients were as sick as those in the other groups on admission and did not differ significantly in the duration of illness prior to treatment, date of immunization, or method of treatment. They were given an initial dose of 750 mg. of chloramphenicol, followed by 500 mg. every six hours. Twenty-four hours later, temperature was normal and remained normal thereafter. Coincident with the drop in temperature, the patients became alert and felt better. Chloramphenicol, 1 gram daily, was continued for an additional three days. Convalescence was uneventful. Figure 2 illustrates the response of this group to drug therapy.

GROUP 2

This group of 32 patients was the largest, and their illness followed the pattern of those treated with chloramphenicol, reported in the literature.[5-12] In these patients the temperature

dropped to normal by lysis in from 48 to 96 hours after the start of drug therapy. Clinical improvement was apparent after the first 36 hours.

Convalescence was uneventful in 22 patients of this group. The remaining 10 had one or more relapses.* It was impossible to

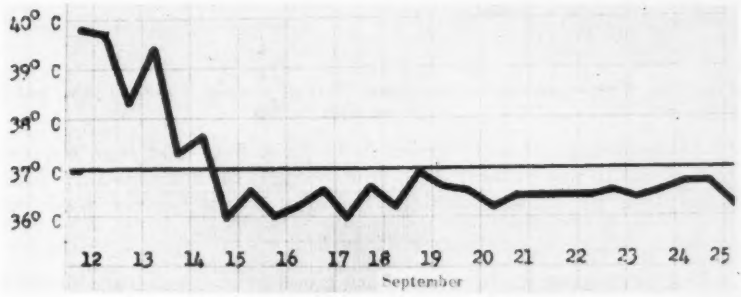

Figure 2. Temperature chart of a patient in group 1.

predict from the original clinical condition which patient would have a relapse. Five patients had one, three had two, and two had three relapses. When this occurred, the patient responded to chloramphenicol as well as he did in the initial disease.

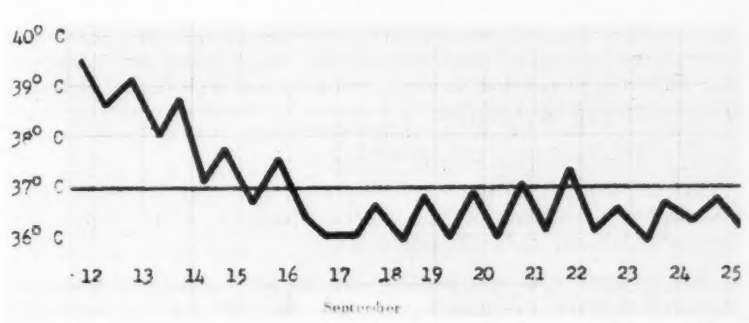

Figure 3. A typical temperature chart of a group 2 patient without complications.

Figure 3 illustrates the temperature response of most patients in this group. Figure 4 is representative of the response of patients who had relapses.

GROUP 3

Group 3 includes three patients who showed little improvement until the fifth day of therapy (fig. 5), despite the fact that 2 grams

*EDITORS NOTE: A. T. John and V. S. Vinayagam in *Lancet* 2: 757-759, 18 Oct. 1952, reported that interrupted courses of chloramphenicol greatly reduced the relapse rate in patients with typhoid fever.

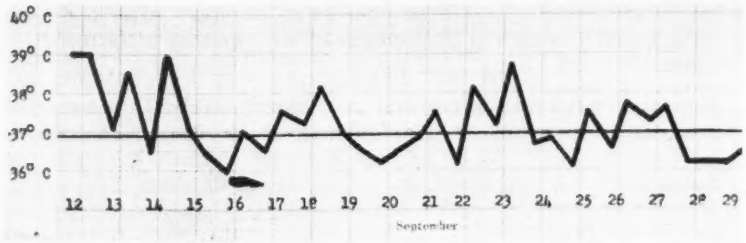

Figure 4. A representative temperature chart of a group 2 patient who had a relapse.

of chloramphenicol were given daily for 4 days and then reduced to 1 gram. In one patient, this course might be attributed to faulty absorption of chloramphenicol because of the severe diarrhea.

GROUP 4

The three patients in group 4 are considered separately because they presented an unusual picture of a diffuse exanthem,[13] although based on the duration of fever they belong in group 3. The lesions of the diffuse exanthem were typical rose spots which were so numerous as to form a generalized rash, most dense over the chest and abdomen and confluent in spots. Individual lesions were from 1 to 3 mm. in diameter, pink in color, flat, round, and did not blanch on pressure. In one patient the rose spots ulcerated and became secondarily infected to form a generalized pustular rash not unlike chickenpox or smallpox. The patients responded to drug therapy, the rash faded, and convalescence was uneventful.

GROUP 5

Four of the 50 patients developed one of the following complications: bowel perforation with peritonitis, toxic meningitis, thrombophlebitis, or lobar pneumonia.

The patient with peritonitis was given 3 grams of chloramphenicol, 2 grams of streptomycin, and 600,000 units of penicillin

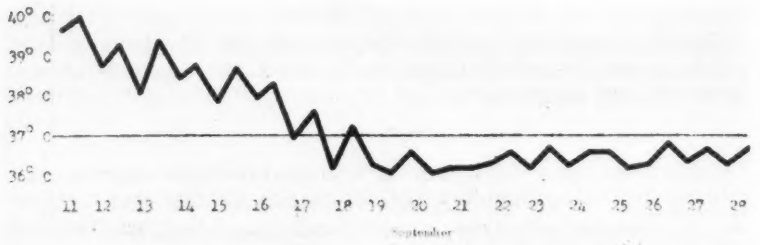

Figure 5. Temperature chart of a patient in group 3.

daily. Pentylenetetrazol was given every four hours for circulatory support and from 2,000 to 3,000 cc. of normal saline were given intravenously daily for the first two days. After 24 hours, his general condition improved and vomiting decreased. Treatment was continued, and by the seventh day his temperature was normal, the leukocyte count was 6,200, his abdomen was soft and nontender, and he was alert, resting comfortably, and hungry. Chloramphenicol dosage was dropped to 1 gram daily. Improvement continued, and on the thirteenth day all antibiotics were discontinued. The patient convalesced rapidly and he was returned to duty. Stool culture was positive for *Salmonella typhosa* on the eleventh day.

Spinal fluid findings in the patient with toxic meningitis were normal, but because of the severity of his symptoms he was given an initial dose of 600,000 units of penicillin and 6 grams of sulfadiazine daily. The next day he was given an initial dose of

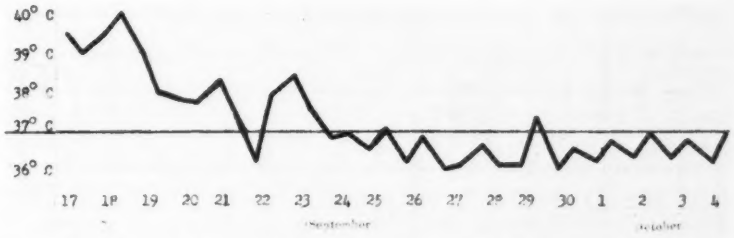

Figure 6. Temperature chart of patient in group 5 with typhoid fever and toxic meningitis.

4 grams of chloramphenicol, followed by 3 grams daily in divided doses. He continued to be disoriented and became opisthotonic. After 48 hours of chloramphenicol treatment with no improvement, 2 grams of streptomycin daily was started.

Twenty-four hours later (four days after admission), his temperature dropped below 38° C. for the first time, but he remained semicomatose and, at times, disoriented. He had several convulsive seizures affecting only the face. These were characterized by fixation of the eyes and spastic contortion of the facial muscles. Rectal chloral hydrate was used successfully for relaxation during these episodes. Projectile vomiting appeared on the sixth hospital day. By the eighth hospital day general improvement was apparent, and from then on his sensorium cleared and his stiff neck, vomiting, and oculogyric crises diminished. On the tenth day streptomycin and chloramphenicol dosages were reduced to 1 gram daily and penicillin was discontinued. The leukocyte count was then 5,200. All medication

was discontinued after 12 days, and he made an uneventful recovery (fig. 6).

The third patient in this group responded to chloramphenicol and after 48 hours was afebrile and asymptomatic. Treatment was discontinued after three days. On the seventh day he complained of pain in the left calf, which, on examination, was found to be 2.5 cm. larger than the right and tender on palpation. The leg was immobilized and only symptomatic treatment was given. All symptoms and signs disappeared after three days and the patient returned to duty.

The patient with typhoid fever complicated by lobar pneumonia was initially given 600,000 units of penicillin daily and 2 grams of chloramphenicol the first day and 1 gram daily thereafter. Temperature returned to normal in 48 hours, and all symptoms cleared by the fourth day. Treatment was discontinued. Physical signs of pneumonia gradually disappeared and the chest was clear by the tenth day.

DISCUSSION

The rarity of typhoid fever in the United States and among United States military personnel in other parts of the world is the result of personal hygiene and sanitation and compulsory immunization of military personnel. This report again emphasizes the importance of the former factor. This epidemic would have been prevented by even the most rudimentary sanitation measures. It was not prevented by immunization.

The small dosage level and short course of chloramphenicol used in the treatment of these patients was necessitated by the shortage and cost of the drug in Turkey. The experience obtained here by virtue of necessity may add to the knowledge of the use of this drug in typhoid fever and be of service in similar situations elsewhere.

Laboratory testing of these patients was minimal because of limited facilities and personnel, but is believed sufficient because of the epidemic character of the outbreak and the clinical findings.

From a treatment point of view the general results were excellent with very small amounts of chloramphenicol. Ten patients each received an average of 5 grams; 22, 7 grams; and six, 12 grams. All of these made an uneventful recovery. This group includes two of the "complicated" cases, the pneumonia and the thrombophlebitis. The 10 patients who had relapses each received an average of 12 grams, but the initial response was achieved with an average of 6 grams. It is reasonable to assume that the relapses would not have occurred if treatment had been continued

at the 1-gram daily level for another five to six days, a total course of 10 days.[7] In other words, 48 of the 50 patients in this series would have been cured with a course of 2 grams the first day and 1 gram daily for 10 days. The remaining two patients cannot be considered in this respect because they had severe complications requiring special management.

The effectiveness of this dosage level is indicated by the fact that no deaths occurred in this series. The mortality rate of patients with typhoid was 10 percent before chloramphenicol came into use, according to statistics from the Preventive Medicine Section, Turkish General Staff.

The effect of previous immunization cannot be determined from this series, but it probably was a factor.[1] All patients in this series had a positive Widal test in 1:200 or greater dilution within the first two weeks of the disease. In unimmunized persons this level would not be expected until the second to fifth week of the disease.[9,13] Because the cure of a patient with typhoid fever is dependent on the development of his immunity, an early rise in the antibody titer of the patient is important. Chloramphenicol carries out its bacteriostatic role while this titer in the host rises. The histories of the patients who had relapses, however, indicate clearly that immunization alone would not have prevented the prolonged febrile course, characteristic of the untreated disease. We, therefore, postulate that a maximal drug effect of chloramphenicol in the patient with uncomplicated typhoid fever can be achieved with doses of 0.5 gram every six hours for the first day and 1 gram daily thereafter. The relapse rate is related to the duration of drug therapy rather than to the drug level.

SUMMARY AND CONCLUSIONS

An apparently water-borne epidemic of typhoid fever involving 112 patients occurred in a Turkish army camp. Fifty of these patients who were treated in one hospital and had been vaccinated against typhoid fever during the previous year were reported in some detail. During the epidemiologic investigation 50 typhoid carriers were found. Forty of these were cured by drug therapy.

Forty-eight patients were treated with chloramphenicol, 2 grams the first day and 1 gram daily thereafter. Therapy was continued for two days after temperature became normal. This therapy was uniformly successful initially, but 10 of the 48 patients had one or more relapses. Patients who had a relapse responded as well to chloramphenicol as they did in the initial illness. There was no evidence of drug resistance or drug toxicity.

We believe that a course of 2 grams of chloramphenicol the first day and 1 gram daily for 10 days would have achieved optimal results in 48 of the 50 patients presented.

Two patients, who were seriously ill because of complications when first seen, required additional drug therapy. All patients recovered without sequelas.

Compulsory immunization alone will not prevent epidemic typhoid fever.

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National Science Foundation Announces Awards

The National Science Foundation has announced 123 awards totaling about $1,332,000 for research in the biological and the physical sciences, and to support studies and conferences on science, scientific information exchange, compilation of scientific personnel information, and travel of American scientists to international scientific meetings.

This is the first group of awards to be made during fiscal year 1954 by the Foundation for the support of basic research and related matters. Since the beginning of the program in 1950, over 525 such awards have been made totaling about $4,967,000. Additional proposals are being evaluated by the staff of the Foundation with the help of advisory panels of outstanding American scientists.

INTESTINAL PARASITIC INFECTIONS IN MILITARY FOOD HANDLERS

ROBERT B. BURROWS, *Lieutenant Colonel, MSC, USAR*

DURING a 16-month period stool specimens from 1,500 military food handlers were examined for parasites at this laboratory. The food handlers were from three sources. The largest number was from Army, Air Force, and Marine Corps personnel attending the Food Service School at the Presidio of San Francisco; the next largest group consisted of personnel assigned to the various messes at the Presidio and its subposts; and the smallest group were personnel assigned to messes at Fort Ord, Calif. About 83 percent of those examined were in the Army because the Marine Corps, and later the Air Force, discontinued sending personnel to the Food Service School at the Presidio.

Procedure

A single specimen was obtained from each person. All specimens were examined by direct and concentration methods and, in addition, those specimens showing protozoa were stained with one of the temporary stains and with tergitol iron hematoxylin.

Results

The results of the examinations made on the personnel of the three services are given in table 1. An insufficient number of Marines were examined to be of significance. The incidence of infection in the Air Force personnel showed strikingly different percentages from that found in Army personnel. Air Force personnel had twice the incidence of *Endamoeba histolytica* (6.7 vs. 3.4 percent), over twice the incidence of hookworm (6.1 vs. 2.5 percent), ten times the incidence of *Hymenolepis nana* (2.4 vs. 0.24 percent), and a greater percent of total helminth infections (10.9 vs. 6.0 percent). Army personnel led in infections with *Ascaris lumbricoides* and *Trichuris trichiura* (3.0 vs. 1.8 percent).

From Sixth Army Medical Laboratory, Fort Baker, Calif.

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TABLE 1. *Incidence of pathogenic intestinal parasites in military food handlers*

Parasite	Army		Air Force		Marine Corps		Total	
	A. P.	T. P.	A. P.	T. P.	A. P.	T. P.	A. P.	T. P.
Endamoeba histolytica	3.4	8.2	6.7	16.3	1.1	2.7	3.6	8.7
Endamoeba coli	16.9	32.5	26.6	51.2	21.4	41.2	18.3	35.2
Endolimax nana	14.8	28.5	24.2	46.5	16.9	32.5	15.9	30.6
Iodamoeba bütschlii	1.1	2.1	1.2	2.3	1.1	2.1	1.1	2.1
Dientamoeba fragilis	.32	.61	1.2	2.3			.40	.77
Chilomastix mesnili	.40						.33	
Trichomonas hominis	.08						.07	
Giardia lamblia	5.0		9.7		9.0		5.7	
Helminth	6.04		10.9		1.1			
Hookworm	(2.5)		(6.1)		(1.1)		2.8	
Ascaris lumbricoides	(.48)						.40	
Strongyloides stercoralis	(.32)		(.6)				.33	
Trichuris trichiura	(2.5)		(1.8)				2.3	
Hymenolepis nana	(.24)		(2.4)				.47	
Number examined	1,246		165		89		1,500	

A. P. = Actual percentage; T. P. = Theoretical percentage.

Information was not available concerning foreign service of the food handlers or their total length of military service. However, the grades of most of them were available and were used as a rough guide to their length of service. The enlisted men were divided into three groups: (a) privates (E-1,2), who generally have had little military service and relatively few of whom have served overseas; (b) privates first class (E-3) and corporals (E-4), who generally have had longer service and more of whom have served overseas; and (c) sergeants (E-5), sergeants first class (E-6), and master sergeants (E-7), the majority of whom have had overseas service and whose military service generally dates back at least to the time of World War II. Incidences of the various infections in these three groups of enlisted men are given in table 2. Omitted from the table are 13 enlisted men, whose grades were not obtained, and 21 officers and warrant officers. Due to the smaller number of personnel examined, similar tables for the Air Force and the Marine Corps would not be statistically valuable.

In tabulating the results according to the grade structure given above, several observations were made. The incidence of infection with *E. histolytica* was close in the three groups, ranging from 3.3 to 3.7 percent, but the incidence of the helminth infection showed an increase with length of service and the incidence for total helminth infection in the three groups increased from 3.5 percent (E-1, 2) to 6.4 percent (E-3, 4) to 11.9 percent (E-5, 6, and 7). Thus, the intermediate grades had almost twice the percent incidence of helminth infection as the lower grades, and the upper three grades had about 3.5 times the percent incidence of the lower grades. Of the 277 men in the upper three grades, 31 men (11.2 percent) harbored pathogenic species (*E. histolytica* and the helminths); of these, 22 had a single pathogenic species, eight had two pathogenic species each, and one had three pathogenic species.

In both tables 1 and 2 the theoretical percentages of infection with the various species of amebas are computed on the basis of data obtained by Sawitz and Faust.[1] According to their data, a single specimen per person, examined by direct, concentration, and staining technics, would show only 41 percent of the infections with *E. histolytica* and only 52 percent of the nonpathogenic ameba infections. All personnel in this survey found to have pathogenic species were treated or had a letter sent to their home station, stating what parasites were found.

Discussion

Three surveys have been made on naval personnel,[2-4] one on marines,[5] and four on Army personnel.[6-9] With the exception

TABLE 2. *Incidence of pathogenic intestinal parasites in Army enlisted men according to grade*

Grade	E-1, 2		E-3, 4		E-5, 6, 7	
Parasite	A. P.	T. P.	A. P.	T. P.	A. P.	T. P.
Endamoeba histolytica	3.4	8.2	3.7	9.0	3.3	8.0
Endamoeba coli	16.8	32.3	19.3	37.1	14.8	28.5
Endolimax nana	12.7	24.4	16.2	31.1	16.6	31.9
Iodamoeba bütschlii	.3	.6	2.0	3.8	1.1	2.1
Dientamoeba fragilis	.2	.4			.7	1.3
Chilomastix mesnili	.5		.3		.4	
Trichomonas hominis	.2					
Giardia lamblia	3.8		6.5		6.1	
Helminth	3.5		6.4		11.9	
Hookworm	(2.1)		(2.6)		(3.6)	
Ascaris lumbricoides			(.9)		(1.1)	
Strongyloides stercoralis	(.2)		(.3)		(.7)	
Trichuris trichiura	(1.0)		(2.3)		(6.1)	
Hymenolepis nana	(.2)		(.3)		(.4)	
Number examined	582		353		277	

A. P. = Actual percentage; T. P. = Theoretical percentage.

of the Marines[5] and those made by Tatsuno and Bushnell[8] and Kraus,[9] the other surveys were made during or immediately after World War II and several included only those with overseas service.[2,3,7]

TABLE 3. *Incidence of helminth infection in military personnel compared with that estimated for the general U. S. population*

Parasite	U. S. population	Military personnel
Hookworm	1.27	7.65
Ascaris lumbricoides	2.11	.27
Strongyloides stercoralis	.28	.61
Trichuris trichiura	.28	1.43
Hymenolepis nana	.08	.29
Taenia saginata and *Taenia solium*	.08	.04
Total	4.10	10.29

Stoll[10] made an estimate of the numbers of people in the world infected with the various species of helminths. Estimates were given also for the various geographical areas. North America included the United States and Canada, but not Mexico and the Caribbean. The majority of infections listed for North America naturally fall in the United States. In table 3 the estimated incidence of the various infections in the United States population is given, based on the figures from Stoll and the estimated population at the time his article was written. For comparison with these, the incidence computed from the combined surveys of military personnel (discussed in references 2-7 and in this survey), a total of 10,499 servicemen, is given. From this table it is evident that the incidence of helminth infection in military personnel is about two and one-half times that in the general population. Only in the cases of *A. lumbricoides* and *Taenia saginata* and *Taenia solium* does the civilian population show a higher incidence. However, ascaris is primarily a childhood infection and relatively few adults of the general population of military age harbor this species.[11] Military personnel had about six times the incidence of hookworm, over twice the incidence of *Strongyloides stercoralis,* over five times the incidence of *T. trichiura,* and nearly four times the incidence of *H. nana.* In addition to the species given in table 3, infections of *Schistosoma japonicum* and *Fasciolopsis buski* occurred in some personnel examined.[7]

Although this survey was made on a group of military food handlers, there is no evidence that the incidence of infection varies greatly from that in other military personnel, because many had been assigned recently as food handlers and, also, examinations made on servicemen who are not food handlers follow the incidence closely.

This would indicate that military service leads to an increase in parasitic infections, and probably more so in those having had overseas service. The various surveys which have been made indicate that over 10 percent of military personnel harbor *E. histolytica* or various helminth infections for which they should be treated.

Summary

Fifteen hundred military food handlers were examined for intestinal parasites and 10 percent were found to harbor pathogenic species. The incidence found in Air Force personnel was higher than that found in Army or Marine Corps personnel. Army enlisted men in the higher grades, who probably had more overseas service, showed a higher incidence than those in the lower grades, who probably did not have overseas service. Military personnel have a higher incidence for nearly all helminth infections than do civilians in the United States.

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THE UNRELIABILITY OF THE RICHARDSON CHEMICAL TEST FOR PREGNANCY

LAURENCE G. ROTH, *Lieutenant, MC, USN*

WALTER G. LEONARD, Jr., *Lieutenant, MC, USN*

IN 1951, Richardson[1] reported a chemical test for pregnancy and claimed 99.1 percent accuracy in over 2,500 tests. The test was proposed for office or clinic practice because it could be completed in half an hour and required only a limited number of reagents. It appeared to satisfy the requirements for a simple but accurate, rapid, and inexpensive test.

The test was described as having two components. The primary test was alleged to demonstrate colorimetrically the presence of free estrone in the urine of a pregnant woman. The appearance of a definite color following simple extraction of the estrone and reaction with 2,4-dinitrophenylhydrazine was considered a positive test. For this particular reaction claims of high accuracy were made. The secondary test also had a colorimetric end point, the extracted estrone combining with meta-dinitrobenzene. This test was admitted to be less accurate, and Richardson mentioned instances where false reactions followed certain medications. He reported it as only a confirmatory test, not to be regarded as necessarily reliable.

CLINICAL EVALUATION

In order to definitely evaluate the Richardson test, a study was projected to include adequate data and controls. The urine specimens used were from definitely pregnant women attending our prenatal clinic and from proven nonpregnant female patients at the outpatient clinic. In addition, some specimens were sent from outlying activities to provide unknowns. The frog test for pregnancy was employed simultaneously with the chemical tests for many of this latter group. In all cases, the presence or absence of pregnancy at the time the test was performed was confirmed by physical examination and follow-up studies.

From the U. S. Naval Hospital, Chelsea, Mass. Lt. Roth is now serving on the U. S. S. *Juneau.*

TABLE 1. *Results obtained with the primary test for pregnancy employing 2,4-dinitrophenylhydrazine*

Number of subjects	Type	Number of positive	Number of negative	Percentage of error
122	Pregnant	118	4	3.3
78	Nonpregnant	34	44	43.6

Specimens from 200 subjects were tested and the results are shown in tables 1 and 2. Early in the study, it became evident that an excessively high proportion of false results were being obtained, particularly false positive reactions. With pregnant women, we obtained false negative results in 3.3 percent with the primary test and in 9.8 percent with the confirmatory test. These results might approximate those obtained in average laboratories with the Friedman and frog tests for pregnancy. On the other hand, with nonpregnant women, we found false positive results in 43.6 percent with the primary test and in 74.3 percent with the confirmatory test. Thus, while a negative result is probably as reliable as with other accepted pregnancy tests, a positive result is so unreliable as to render the test valueless.

TABLE 2. *Results obtained with the confirmatory test for pregnancy employing meta-dinitrobenzene*

Number of subjects	Type	Number of positive	Number of negative	Percentage of error
122	Pregnant	110	12	9.8
78	Nonpregnant	57	21	74.3

COMMENTS

Fischer and McColgan[2] carried out a spectroscopic evaluation of this colorimetric test in a series of 302 patients. Collecting two specimens on consecutive mornings from each patient, their over-all incidence of error was 53 percent. In only 195 cases could the results be duplicated from the two specimens. These investigators explored the false positive tests and demonstrated that pyruvic acid in the urine produces such a reaction. When the pyruvic acid was removed by the Eister procedure, the tests became negative. Thus, any person who has recently exercised might have a false positive test from the presence in the urine of this intermediary metabolite. Solutions of pure estrone were also tested and these produced a positive reaction. The absorp-

tion curve of the pure estrone, however, was not identical with the curve obtained from the urine of known pregnant women. This is an indication that the basis of the positive test is not necessarily free estrone as Richardson claimed.

Even greater doubt is cast on the tests by the report of Stimmel,[3] in which it is restated that the established tests for estrone (Kuber and Zimmerman) do not give a positive result on urine until the tenth week of gestation or later. This is not compatible with the claim for positive tests in pregnancy prior to the first missed menstruation. Stimmel noted that the major portion of the urinary estrone remains in the chloroform fraction that Richardson discards in his extraction process. The aqueous fraction that Richardson tests contains large amounts of androgens, which, like estrone, combine with the reagents to give the same colorimetric response.

These two reports indicate that the colorimetric reaction involves not only estrone, but also substances such as androgens, other steroids with a phenolic group, pyruvic acid, and other organic acids and phenols with a ketone or aldehyde group. The pH at which the reactions occur is of significance, another factor not satisfactorily considered in the Richardson test.

SUMMARY

The Richardson chemical tests for pregnancy were evaluated by testing urine specimens from 122 women proved to be pregnant and from 78 women proved to be nonpregnant. False positive results were obtained in 43.6 percent of the nonpregnant group with the primary test and in 74.3 percent with the confirmatory test. False negative results were obtained in 3.3 percent of the pregnant group with the primary test and in 9.8 percent with the confirmatory test. As presently described, the tests must be regarded as inaccurate, unreliable, and not clinically useful.

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PURULENT URETHRITIS

A Study of 257 Cases

JOHN T. LOGUE, *Captain, USAF (MC)*

FRANK L. BIRD, *Captain, USAF (MC)*

FOR the past year the venereal disease control section at this hospital in Western Germany has been restudying the problems of proper diagnosis and treatment of urethral discharges, particularly nongonorrheal urethritis.

We have attempted to exclude all cases of urethritis due to alcohol, trauma, or chemical irritants. Infestation with *Trichomonas vaginalis* did not seem to be a major cause of purulent urethritis in the patients studied here. Excluding urethritis due to these causes, we have carefully followed 257 patients with persistent purulent urethritis until they were free of symptoms and discharge.

METHODS

All patients were carefully questioned as to the date of onset of symptoms, date of last sexual intercourse, the relationship of the discharge to alcoholic intake, the presence or absence of urinary symptoms, the previous history of urethral discharge, and the method of prophylaxis. Smears of the urethral discharges stained by the Gram method were made daily for three days before any treatment was begun, unless *Neisseria gonorrhoeae* was identified positively. Cultures of the discharges were grown on thioglycollate, blood agar, and on chocolate agar under CO_2.

One hundred and sixteen (44 percent) of our cases proved to be gonorrheal urethritis. These patients were given 300,000 units of aqueous penicillin daily for three days with prompt subsidence of symptoms and urethral discharge. Two of these patients had a recurrence of urethral discharge due to *N. gonorrhoeae* within a week, but it cleared completely when treatment was resumed with sulfadiazine. Both patients denied sexual exposure in the interim. There were two cases of urticaria, presumably due to treatment with penicillin, and one case of gonorrheal arthritis in this group of patients. We were treating 60 percent of these patients for the initial occurrence of urethral discharge.

From U. S. Air Force Hospital, Rhein/Main Air Base, Germany.

The remaining 141 cases (56 percent) in our series were classified as nongonorrheal urethritis. These cases were similar in most respects to the cases described by Graham.[1]

We were unable to identify any pathologic organism either by smear or culture which could be incriminated as the cause. Diphtheroids along with other surface contaminants were frequently found. Gram-negative rods were grown in abundance, and gram-positive cocci and diplococci were grown in some cultures.

TREATMENT

Response to treatment in this group of nongonorrheal urethritis differed from Graham's results. The most important aspects of treatment were abstinence from sexual intercourse and alcohol, avoidance of urethral manipulation, and the maintenance of immaculate personal hygiene. With this regimen alone, 36 patients (26 percent) with nongonorrheal urethritis were symptom-free within 48 hours without the use of antibacterial agents.

Because a persistent nongonorrheal urethral discharge developed while several patients were receiving penicillin for gonorrhea, we decided to treat 15 others with nongonorrheal urethritis with penicillin. Six of the patients in this group apparently responded to penicillin in doses of 300,000 units daily for three days. The remaining nine patients who did not respond to penicillin were treated with sulfadiazine with subsequent relief of symptoms.

Ninety of the patients with nongonorrheal urethritis were given sulfadiazine, sulfisoxazole (gantrisin), aureomycin, or methenamine mandelate (mandelamine). Chloramphenicol was not used in treating any of our patients because of the reports of aplastic anemia resulting from its use.[2, 3] In all patients with persistent purulent nongonorrheal urethritis we were able to obtain relief of symptoms and subsidence of discharge if we used these drugs in conjunction with repeated prostate massages, and sitz baths when indicated. All observers agreed that the use of an antibacterial agent hastened the subsidence of symptoms. In our experience sulfadiazine seemed to give the fastest and most satisfactory results. Aureomycin, sulfisoxazole, and methenamine mandelate gave promising results, but the total number of patients treated with them was too small to evaluate their true worth. In a recent report, Crouch and his associates[4] in the Far East obtained best results with aureomycin.

Seventy-two percent of the 141 patients with nongonorrheal urethritis had no previous history of urethral discharge. This may account for the encouraging results of treatment. It is diffi-

cult to determine whether or not a given case of urethral discharge is a recurrence or a new infection. Treatment is more discouraging in those patients who have had more than one episode of urethral discharge during a short period of time. Even though we were able to obtain a history of sexual exposure in all of our patients with nongonorrheal urethritis, we do not believe that nongonorrheal urethritis is primarily a true venereal disease for it has been seen frequently at this station when no positive history of exposure could be obtained. Our knowledge of the pathogenesis of the nongonorrheal urethral discharge is incomplete and many factors have yet to be evaluated.

About 36 percent of both the gonorrheal and the nongonorrheal urethritis patients used either intraurethral prophylaxis after intercourse, or a condom, or both, but developed urethral discharge despite these precautions. This apparent high failure rate for readily available prophylaxis methods is indeed discouraging.

SUMMARY

Two hundred and fifty-seven patients with purulent urethritis have been studied. Of these, 44 percent had gonorrhea. They responded well to penicillin therapy. The urethritis in 56 percent was nongonorrheal in origin, and the patients responded to various drugs when used in conjunction with prostate massage and sitz baths. Good therapeutic results did not occur unless the patient abstained from sexual intercourse, urethral manipulation, and alcohol during the course of treatment. Sulfadiazine was the most effective drug in the treatment of nongonorrheal urethritis in this series. Although a history of sexual exposure was obtained in all our patients with nongonorrheal urethritis, it is stressed that nongonorrheal urethritis also occurs when no such clear-cut history can be obtained. About 36 percent of the patients in both groups developed urethritis despite apparently adequate attempts at prophylaxis at the time of exposure.

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SPEECH CORRECTION SERVICE

LOIS B. SENFT, *M. A.*

ARAM GLORIG, *M. D.*

IT is recognized that a person with defective speech is in need of special therapeutic assistance. Because a wide range of speech difficulties is encountered among personnel of the armed services, it has been necessary to establish a center, the purpose of which is to assist any person who has a speech dysfunction so that he may perform his service duties with greater efficiency.

There was no single center for audiology and speech correction until 1946. During World War II, several large Army hospitals provided therapy for patients with brain injuries, speech prostheses when required, and psychotherapy for stutterers, but no unit for the specific treatment of speech disorders was organized. After the war, a specific division designated as the Audiology and Speech Correction Center was established at this hospital. Although at first the case load of the center was comprised almost entirely of patients who had difficulty hearing, it soon became known that the rehabilitation services encompassed patients with aphonia, dysphonia, cleft palate, stuttering, dysarthria, articulatory defects, delayed speech, cerebral palsy, or brain injuries, and those who had had a laryngectomy or glossectomy. Increasing numbers of patients were referred to the speech correction section from other hospitals and from the medical facility of the Veterans Administration and the Federal Security Agency. From 1 January 1948 to 31 December 1952, 3,414 patients were treated in the speech correction section. The types of cases examined and treated are summarized in table 1.

ORGANIZATION

A staff of professional and secretarial personnel conduct the program at the center. The professional members include two otologists, one clinical psychologist, a social worker, seven audiometricians and acoustic specialists, three auditory training therapists, five speech reading specialists, four speech pathologists, and one electrical engineer. After receiving a complete

From Walter Reed Army Hospital, Washington, D. C.

physical examination, all patients are individually interviewed and examined by a clinical psychologist and given a hearing evaluation and speech appraisal. Weekly staff conferences allow for the co-ordinated discussion of the findings on each patient; subsequent referrals are made to the appropriate service of the hospital when indicated.

TABLE 1. *Patients treated at the speech correction section from 1948 through 1952*

Diagnosis or program	Number of patients
Speech insurance for patients who have difficulty in hearing	2,581
Defective articulation in patients who have difficulty in hearing	275
Other articulation problems	13
Laryngectomy	99
Aphasia	155
Delayed speech in children	58
Children with cerebral palsy	5
Stutterers	113
Dysphonia-aphonia	87
Cleft palate in children and adults	26
Glossectomy	2
Total	3,414

The speech clinic is equipped with amplification aids, recording machines, and playback sets for stimulating the patients, demonstrating progress, and keeping permanent records for research and teaching. Other equipment includes gated compression units for those with hearing losses, a spirometer, and a sound level meter. Complete series of records, movies, books, and other materials are available. Constant revision and addition of materials are accomplished.

The center serves as a teaching source for graduate students of the University of Maryland, and continuous research is conducted under the supervision of the clinic staff.

Table 2 gives the cause and specific speech disabilities suffered by adults and children, the staff required to make the diagnosis and treat the patient, and his possibility of returning to duty. Stuttering may be primary or secondary. The former is manifested by easy repetitions and prolongations; the latter by

TABLE 2. *Speech disabilities*

Disability	Cause	Staff required	Return to duty
Aphonia or dysphonia	Contact ulcers, vocal nodules, polyps, plica ventricularis, misuse of voice, incorrect habitual pitch or volume, emotional difficulties	Otolaryngologist, psychologist, psychiatrist, speech pathologist	Yes
Patient who had had a laryngectomy	Carcinoma, tuberculosis, et cetera	Otolaryngologist, psychologist, speech pathologist	Generally retired from active duty. Three returned to duty in 1952
Stuttering, primary and secondary types	Emotional or physiologic	Psychiatrist, psychologist, neurologist, social worker, speech pathologist	Determined by team
Dysarthria	Injuries of the central nervous system	Neurologist, neurosurgeon, psychologist, social worker, speech pathologist	Dependent upon severity of residuals accompanying the dysarthria
Articulatory defects, slightings, omissions, distortions, and substitutions of sounds	Mental deficiency, cerebral palsy, cleft palate, hearing deficiencies, emotional factors	Otologist, audiometrician, speech reading specialists, auditory training therapists, speech pathologist, psychiatrist, psychologist, social worker	Yes
Glossectomy	Carcinoma, et cetera	Pathologist, plastic surgeon, prosthodontist, psychologist, speech pathologist	

TABLE 2, *Speech disabilities*—Continued

Disability	Cause	Staff required	Return to duty
Aphasia	Cortical insult including gunshot wounds, cerebral vascular aneurysm, tumors, et cetera	Neurologist, neurosurgeon, psychologist, social worker, speech pathologist, occupational therapist, and physical therapist	Dependent upon the severity of the disability. Frequently patients referred to Veterans Administration Aphasic Center following discharge
Cleft palate speech	Cleft palate or insufficient palatopharyngeal closure.	Plastic surgeon, prosthodontist, psychologist, speech pathologist, and social service worker	Yes
Cerebral palsy speech	Damage of the central nervous system	Neurologist, pediatrician, physical and occupational specialists, psychologist, social worker, and speech pathologist	
Delayed speech or retarded development of speech in children	Mental deficiency, cerebral agenesis, cleft palate, hearing deficiencies, or emotional factors	Psychiatrist, neurologist, otologist, pediatrician, psychologist, social worker, audiometrician, and speech pathologist	

fear reactions, forced prolongations, repetitions, facial contortions, avoidance reactions, and substitutions of words.

If the patient is considered to have a speech difficulty within the limits outlined in table 2, he is transferred through the Armed Services Medical Regulating Office to the Audiology and Speech Correction Center, Walter Reed Army Medical Center.

CONCLUSIONS

The needs of a patient handicapped by a speech defect can best be met at a center where the co-ordinated services of many professional skills can be used. Treatment is facilitated by the presence of specialized, trained personnel and by the use of modern electronic equipment.

Value of the Clinical Conference

The clinical conference, in which students, house officers, and faculty participate, is probably the best teaching exercise in our medical schools today. We need to make the clinicopathologic conference, as Churchill of Boston has so aptly remarked, less of a guessing game and more of a critical review directed at ascertaining whether the therapeutic course prescribed and followed was the best that could have been offered the patient. In other words, how much better, if at all, was postmortem wisdom than ante-mortem vision?

It must be heartening to undergraduate medical students to see how fallible their professors are. It must be even more reassuring to them to hear their teachers confess their errors, pointing out how, at various stages in the illness, a more astute and sensitive appraisal of the situation might have had a better and happier ending. Conferences, conducted with the greatest candor, in which the spirit of the discussion is directed at determination of how the milk was spilled—not who was responsible for spilling it—produce an atmosphere, I believe, in which students are most likely to be imbued with a passion for the pursuit of knowledge.

—OWEN H. WANGENSTEEN, M. D.

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THE ARMY PHYSICAL MEDICINE SERVICE

CHARLES D. SHIELDS, *Lieutenant Colonel, MC, USA*

PHYSICAL medicine and rehabilitation has developed as a special field of medical practice to meet specific needs of certain patients. The growth of this specialty since World War II has created a demand for trained personnel who are not always available. Physical medicine services are established in comparatively few Army medical installations. It is, therefore, appropriate to present a concept of the purposes and use of this service.

AR 40-705 states that "Physical Medicine includes the co-ordinated and integrated employment of physical therapy, occupational therapy, and physical reconditioning in the professional management of the sick and wounded." This does not define our medical efforts but mentions some of the means that are available to the physician in his practice. Physical Medicine may be defined as a special field of medicine concerned with the diagnosis and treatment of neuromuscular diseases and certain musculoskeletal defects. The prime purpose is to restore the individual to maximum physical capacity.

Paragraph 9a, SR 40-705-1, states in part: "a. A Physical Medicine Service will be maintained—

(1) At all hospitals designated as class II installations

(2) At hospitals at selected class I installations designated by The Surgeon General (hospitals having a medical officer, MOS 3180—hereafter designated "physiatrist"—assigned for duty), and

(3) Overseas, at hospitals designated by the theater commander concerned."

PHYSICAL MEDICINE AND REHABILITATION

In civilian practice the specialty is described as physical medicine and rehabilitation. In the Army we use only the term physical medicine. Practice in the Army should not be greatly different from practice in civilian life, with the possible exception of our reconditioning activities for convalescent soldiers. Army policy

From Office of the Surgeon General, Department of the Army, Washington, D. C.

directs that sick and wounded who will not be returned to duty be transferred to the Veterans Administration. This may affect the magnitude of our efforts but it must not affect the availability or the quality of this essential service. It is not always possible to determine immediately that a given patient will not return to duty and certain classes of patients are not eligible for transfer to the Veterans Administration. If physical medicine procedures are necessary, they are indicated when the patient takes to his bed with disease or injury.

Physical medicine is concerned not only with therapy but also with diagnosis. Patients are usually referred to the service because of some generalized or segmental weakness associated with the neuromuscular or musculoskeletal system. Examples of these conditions are: chronic neurologic diseases, poliomyelitis, paraplegia, hemiplegia, arthritis, and peripheral nerve injuries. Supplemental therapy is also offered for many other types of medical and surgical patients. When physical rehabilitation becomes the major problem in the management of these neuromuscular diseases the patient should become the responsibility of the physical medicine service. This service, like any other specialized effort, is not complete within itself. Every person who is disabled has some emotional reaction to his disability and may have difficulty with any of his special senses or systems. Physical medicine personnel must recognize the broad social responsibilities that the physician and his associates are asked to assume in modern medical practice. Many of our physically disabled patients need the advantages of education in special schools, with specially trained teachers.

The military services sponsor and conduct a high type of technical training in their school systems. Some of our less severely physically handicapped personnel, who are retained in service have had and may receive training and retraining in these facilities so that they may continue their military careers. Physical and vocational rehabilitation of the severely handicapped is of necessity a responsibility of other agencies, but our patients must have the best in physical rehabilitation as long as their condition warrants, or until they cease to occupy our beds.

PERSONNEL

Duties of personnel assigned to the physical medicine service. It is the duty of the physiatrist to examine the patient, make a diagnosis, estimate the reversibility of a given condition, prescribe treatment and the goal of treatment, to evaluate progress, and to discharge the patient when maximum benefit has been reached. It is the duty of the therapist to supervise and render the therapy and training as it has been prescribed by the physician.

It is the duty of the technician to assist the physician or the therapist; he is never given direct responsibility for the treatment of the patient.

Assignments. In every human endeavor there seems to be a shortage of trained people. Personnel must, therefore, be used to the best advantage. Patients with neuromuscular diseases and musculoskeletal defects are usually assigned to specialized installations. Because physical medicine is concerned chiefly with the treatment and training of the physically disabled adequately staffed and highly specialized services are established where there are large numbers of patients with amputations, paraplegias, hemiplegias, poliomyelitis, peripheral nerve injuries, and like conditions. It is desirable to assign a physiatrist wherever there are physical and occupational therapists and physical reconditioning officers, but this is not possible and we must be realistic. The physical therapist and the occupational therapist in smaller hospitals must continue to render treatment to patients with fractures, under the supervision of the orthopedist; to medical patients (*e. g.,* arthritis) under the supervision of the internist; to surgical patients (*e. g.,* burns) under the supervision of the surgeon.

It is doubtful that we shall ever have enough physicians trained in physical medicine and rehabilitation to supervise all our therapists. Fortunately our system of specialized centers minimizes the need. There is, however, a great need for other physicians who use the services of physical therapy and occupational therapy to have some understanding of the basic fundamentals of physical medicine and rehabilitation.

Physical therapy and occupational therapy are most effective when they are part of a complete medical program. The therapists are trained in the technics of treatment and the theory necessary for their application. They are not trained in diagnosis and indications, and are placed in an embarrassing and untenable position when they are asked to assume these obligations.

HOSPITAL WARDS

The purpose of physical medicine wards is to treat patients whose major need is physical rehabilitation and training. Advantages are: (1) patients with similar disabilities are gathered together for better control and service; (2) therapy and training are available for longer periods each day; (3) convalescence may well be shortened because patients who are approaching maximum benefit from training and therapy serve as an inspiration to those who are newly arrived; and (4) the special technics of rehabilitation nursing are made available, and all personnel who have duties on these wards can develop in themselves and in their pa-

tients an improved concept of disability and the technics of its management.

Controlled wards offer better training opportunities in teaching hospitals for residents, interns, and ancillary medical personnel whose mission is training of the disabled soldier to obtain maximum capacity by full use of his residual abilities.

Physical medicine wards must not be confused with custodial care of convalescent patients who are about to return to duty or who are awaiting some other type of disposition. These patients do not need the services of specialized physicians and therapists.

OBJECTIVES

The ultimate aim of physical medicine and rehabilitation is to provide the patient with maximum functional capacity for self-care and self-support.

Physical medicine technics are designed to:

1. Prevent contractures and deformity of paralyzed segments and to protect and support soft tissue weakness. This seldom means total immobilization unless bone damage also exists and the patient is a primary orthopedic responsibility. Functional devices have limited use and can give the patient a false sense of security. They should be easily and frequently removed so that the therapist and the patient may extend their efforts to prevent tightness and contractures. They are only a part of a complete program. They must be removed in whole or in part as soon as function returns to an adequate level. When loss of function is permanent, functional devices may be used to adapt a segment to function.

2. Establish and improve function of innervated segments.

3. Improve muscle power and strength, joint range of motion, and functional capacity in individual segments or on a general basis.

4. Provide a means of physical rehabilitation within the physical capacities of the patient. In most clinics this includes a minimum of prevocational testing and little or no vocational training. Care of the patient must include some assistance toward proper motivation, recognition, and acceptance of the disability and a reasonable concept of self-care and responsibility.

DISCUSSION

An adequate, efficient physical medicine service can be established only by trained personnel with proper space and equipment. High standards of training for physicians, therapists, and technicians must be established and maintained.

Improved standards of medical care have resulted in a great increase in the number of individuals who are not physicians, but who render services to our patients. It is most essential that the medical profession determine what services these ancillary personnel should render to the patient and how much training they need to do their job well. It is also essential that they be continuously under medical supervision so that they do not develop forms of independent practice that permit them the privileges of the physician without his responsibilities. This does not mean that training of therapists and others should be decreased or altered for it is only with high standards of training that the physician can effectively and dependably use their services.

Many of the technics of physical medicine and rehabilitation seem simple in themselves, but they are numerous, and only skilled personnel can use them effectively. We sometimes hear that "Anyone can do those things for patients." This concept has retarded total rehabilitation and its value to the patient and to the Nation for many years. Anyone can hand a patient crutches, but some skill, training, and experience is necessary to teach him to use the crutches. Too many patients have been taught to wear a prosthesis without being taught to use one to best advantage. The ultimate efficient value of physical medicine and rehabilitation is determined by its benefit to the patient.

Until recent years training for physicians in physical medicine and rehabilitation was far from adequate. It is still not perfect, but residency training is better organized and prepares physicians much better to understand their mission and to assume responsible positions. The intrinsic value of this special field is evidenced by its rapid growth and the demand for well-trained personnel to meet existing needs. Sound growth and a continuous supply of physicians and therapists seeking training can be assured only by the establishment of adequate services operated by thoroughly trained personnel where a real need exists.

SUMMARY AND CONCLUSIONS

Physical medicine is a special field of medical practice concerned with the diagnosis and treatment of neuromuscular diseases and certain musculoskeletal defects. Physicians, therapists, and technicians work as a team and each has his own duties and responsibilities. Patients who merit these services should receive the best available treatment and training while they remain in the hospitals.

Complete physical medicine services must be established in specialized centers where the need is greatest. A shortage of physicians trained in the specialty necessitates that therapists and technicians be assigned to certain installations to treat patients under the supervision of physicians who are not specialists in physical medicine.

A physical medicine ward has its advantages in treating patients whose major need is physical rehabilitation and training, and it offers training opportunities for residents, interns, and ancillary medical personnel. The ultimate aim of physical medicine and rehabilitation is to provide the patient with maximum functional capacity for self-care and self-support.

U.S. Army Hospitals Opened to ROK Patients at Taegu and Pusan

On 2 November 1953 the first ROK Army patients were transferred to the 25th U. S. Army Hospital at Taegu and to the 21st Station Hospital at Pusan as part of a widespread program to relieve congestion in Korean hospitals and broaden the medical assistance given our allies. Shown above, from left to right, at the 1st ROK Army Hospital are the senior medical officers who directed the initial movement of patients: Colonel Raymond E. Duke, MC, USA, Chief of Operations, Office of the Surgeon, U. S. Army Forces, Far East; Colonel Rollin L. Bauchspies, MC, USA, Surgeon, Korean Communications Zone; Brigadier General Shin Hak Shin, Surgeon General, Korean Army; and Colonel Frank O. Alexander, MC, USA, Surgeon, U. S. Military Advisory Group to the Republic of Korea.

AN EVALUATION OF EFOCAINE IN RECTAL SURGERY

MELVIN B. SULLIVAN, *Lieutenant, MC, USN*

MARVIN L. GERBER, *Commander, MC. USN*

VARIOUS methods for the alleviation of postoperative pain following rectal surgery have been described. The importance of the problem is manifest by the reluctance of many patients with rectal symptoms to consult a surgeon or by refusal to undergo rectal surgery. Attempts to solve this problem have taken various forms. Several different technics of hemorrhoidectomy have been advocated, often with the claim that a particular method results in less postoperative pain. Likewise, many surgeons have tried to minimize pain with elaborate and expensive programs of postoperative care.

It has long been obvious that a local anesthetic with a prolonged effect would have an ideal application in the prevention of pain following hemorrhoidectomy, provided that it fulfilled certain criteria: (1) the agent should actually prevent pain in the majority of the cases in which it is used; (2) its use should not result in complications such as delayed wound healing, sloughing, or abscess formation; (3) relief of pain should not be accompanied by incontinence; and (4) the agent should be systemically nontoxic in therapeutic dosage.

In 1928, Yeomans and his associates[1] introduced a method for producing long-acting local anesthesia. They found that by dissolving the anesthetic agent in oil, effective relief of pain was obtained for several days. Various mixtures of anesthetic agents in oil were subsequently developed and gained wide popularity. However, in 1943 Smith[2] reported that 6 percent of his rectal surgery patients developed postinjection abscesses. Other authors had reported a similar incidence of complications. Finally, Duncan and Jarvis[3] demonstrated that the prolongation of anesthesia was due to the neurotoxic action of the common preservative, benzyl alcohol, and was not due to the slow absorption of the anesthetic agent from its oil base as had been previously thought. Following these reports, anesthetics in oil fell into disrepute,

From U. S. Naval Hospital, Bethesda, Md.

and not until efocaine was introduced in 1952 was a promising long-acting local anesthetic available.

Efocaine is described as a nonoily, aqueous-miscible, saturated solution of procaine, procaine hydrochloride, and butyl p-amino benzoate in a nontoxic, aqueous solvent. Its property of long action is due to precipitation on dilution with minute amounts of tissue fluid, and the subsequent slow absorption of the crystalline procaine base, with minimal toxicity and tissue damage. These claims for efocaine are supported by a number of authors[4-9] who found that effective local anesthesia was produced for from 6 to 14 days, that the agent materially decreased postoperative narcotic requirements, and that its use was not attended by complications.

In order to evaluate its effectiveness and safety, a record of the narcotic requirements and ensuant complications was maintained for 100 consecutive patients undergoing hemorrhoidectomy, 51 of whom received the drug. The decision to use efocaine was that of the operating surgeon, but no selection of patients was exercised. The technic of injecting it as described in previous articles and in the descriptive commercial brochure was carefully observed in all cases. From six to 10 cc. of efocaine were injected preoperatively through the prepared perianal skin, care being taken to avoid penetration of the rectal wall and pooling of the agent. All patients had caudal block anesthesia, and the surgical technic and postoperative care were similar.

TABLE 1. *Requirement for narcotics, with and without efocaine*

	Received efocaine	Did not receive efocaine
Total number of patients in each group	51	49
Average number of doses of narcotics required	3.7	3.2
Morphine or meperidine hydrochloride	(2.0)	(2.5)
Codeine	(1.7)	(0.7)
Average number of days narcotics were required	3.1	2.1
Number of patients not requiring any narcotics	7	5

The patients who received the drug required an average of 3.7 doses of a narcotic over a period of 3.1 days (table 1). It should be pointed out that only 2 doses of morphine or meperidine hydrochloride (demerol) were required and the remaining 1.7 doses were

codeine.* The patients who were not given efocaine required an average of 3.2 doses of a narcotic over a period of 2.1 days, but 2.5 doses were morphine or meperidine hydrochloride, and 0.7 doses were codeine. Seven of the patients who received efocaine did not require any postoperative narcotic as compared with five of the patients who did not receive efocaine. Six postoperative perianal abscesses developed in the series, all of them in patients who had received the anesthetic agent. In one of these patients the skin margins had been sutured inadvisedly and this may have contributed to the abscess formation. If this case is excluded, the incidence of complications is 9.8 percent for the patients who were given efocaine and 0 percent for those patients who did not receive it. None of the patients in either group developed incontinence postoperatively, and no evidence of systemic toxicity was noted in patients receiving efocaine.

SUMMARY

A record of the narcotic requirements and ensuant complications was kept on 100 consecutive patients undergoing hemorrhoidectomy, 51 of whom were given efocaine. There was little, if any, demonstrable relief of posthemorrhoidectomy pain in the efocaine group as compared with the controls. The incidence of perianal abscess was approximately 10 percent in the efocaine group, whereas this complication was absent in the control group.

It is recognized that our experience with the anesthetic agent is at variance with the experience of the majority of those who have reported on its use. No explanation for this is apparent.

*The codeine requirements for the patients receiving efocaine are estimated by the increased and prolonged requirements of the patients who developed complications.

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SIMPLIFIED AND EFFECTIVE METHODS FOR FILLING ROOT CANALS

HARRY J. HEALEY, *Commander, DC, USNR*

As a result of recent developments in pharmacologic remedies used as adjuncts to the mechanical cleansing of septic root canals, including the intracanal antibiotic therapy advocated originally by Grossman,[1] the problem of obtaining a sterile canal through endodontic treatment has been reduced to a minimum. Verification of such a sterile condition is facilitated by the use of routine bacteriologic smear and culture tests. Negative tests, together with the favorable clinical signs of no tenderness in the tooth, no foul odor in the canal, and no excessive exudate in the canal, provide an accurate basis for the determination of the readiness of the root canal for filling.

The obtaining of a sterile condition in the root canal, however, is only a part of the procedure required to maintain the tooth in a state of health. It is necessary to obliterate the canal space completely with a nonirritating and hermetic sealing agent. Failure to do so will result in the accumulation and stagnation of tissue fluids in the unfilled canal or any unfilled portion thereof. These stagnated fluids provide an excellent nidus for bacterial growth, with inevitable acute or chronic apical periodontal involvement. Adequate attention, therefore, should be given to the canal-filling portion of endodontic therapy.

GUTTA-PERCHA TECHNIC

Although other materials have been advocated for the filling of the treated canal, the use of gutta-percha together with an antiseptic cementing substance enjoys the most popularity because of the ease of manipulation of those materials and the excellent results achieved. Several methods may be followed in filling the canal, the one of choice being determined by the size, shape, and general anatomy of the canal.

The single-cone method is used to advantage in those canals which, because of their small size, can be almost completely

From Indiana University School of Dentistry, Indianapolis, Ind.

obliterated by the use of one gutta-percha cone. The sealing of a properly fitted cone into the canal with the antiseptic cementing substance results in the obliteration of the entire canal space.

The lateral condensation method is effective in the larger canals where a single or master gutta-percha cone falls decidedly short of filling the canal in the areas lateral to the master cone. The procedure consists of carrying a previously fitted master cone to its correct location in the canal, the walls of which have been coated with the antiseptic cementing substance. The master cone is condensed laterally against a wall of the canal, thus eliminating the space on that side of the cone and increasing the space on the other sides. The increased space is then filled in with a series of previously prepared, smaller, auxiliary gutta-percha cones until it is entirely obliterated.

The sectional method also is used in larger canals as well as in the smaller ones. It is particularly indicated for treating a tooth which, because of extensive loss of coronal substance, will require a metallic post in the root canal as retention for the restoration of the crown subsequent to endodontic therapy. In this method the apical 3- to 4-mm. section of a previously fitted master gutta-percha cone is cemented into its correct apical location in the canal, using the antiseptic cementing substance. The remainder of the canal space is then obliterated by condensing into it a series of sections of gutta-percha which have been softened by being warmed slightly. The resulting secureness of the important apical portion of the canal filling guards against its dislodgement when enough of the filling is removed for the accommodation of the retentive post.

The sectional method also is effective in the filling of the canals of teeth wherein the apexes of the roots are not completely formed and the canals are extremely wide. In such a case, a large master gutta-percha cone inserted butt end first into the canal is properly adjusted and fitted. The apical segment is sealed in its correct position and the remainder of the canal is left unfilled until the return of the patient for the next appointment. At that time, the efficacy of the sealing of the apical foramen by the previously placed gutta-percha segment is determined by the lack of intracanal periapical fluid seepage. If conditions are favorable, the remainder of the canal is then filled by completion of the sectional method procedures.

The proper fitting of the master gutta-percha cone is essential to all of the foregoing methods. It should be as large as will pass completely to the apical end, and its adjusted apical cross section should fit the apical foramen snugly. This will prevent protrusion of the master cone into the periapical space as a result of condensation procedures incident to the filling of the canal.

The following antiseptic, nonirritating, and radiopaque root canal cement advocated by Rickert[2] is characterized by ease of manipulation, adequate working time, and permanence of dimensional form:

Powder	Percent
Zinc oxide, C. P.	41.2
Precipitated silver, C. P.	30.0
White rosin	16.0
Thymol iodide, N. F.	12.8
Liquid	
Clove oil, U. S. P.	78.0
Canada balsam	22.0

SILVER CONE TECHNIC

The use of metallic master cones in the filling of root canals is not entirely new, but Jasper[3] developed and refined the use of silver cones in filling certain canals having special anatomic characteristics. The curved, narrow, or tortuous canals often occurring in the lower anterior teeth and the upper bicuspids, the buccal canals of upper molars, and the mesial canals of lower molars are more amenable to the fitting of the stiffer silver cone than of the softer gutta-percha cone. In many other cases where the single cone or lateral condensation method is to be employed, a master cone of either silver or gutta-percha can be used optionally with equally effective results. The use of silver cones, however, is contraindicated in the canals of teeth that have such extensive loss of coronal tooth substance as to necessitate the use of a metallic post in the root canal as retention for the ultimate restoration of the crown of the tooth. This is because of the difficulty or even impossibility of removing a portion of the canal filling for the accommodation of the retentive post without dislodging the important apical portion of the filling.

Figure 1 is a radiograph of a lower cuspid having a necrotic pulp with apical periodontal involvement, resulting from lack of earlier treatment. Figure 2 represents the fitting of a master silver cone into an enlarged canal. The cone blocks the apical foramen and snugly fits the canal in its apical one half. Additional space in the crown portion of the canal can be seen. In order to provide a guide as to the correct location of the cone when it is reintroduced, the incisal excess of the cone has been bent over the incisal edge of the tooth. Figure 3 shows the canal filled by the lateral condensation method, using a master silver cone. The additional space in the crown portion of the canal seen in figure 2 has been completely obliterated through the use of smaller auxiliary gutta-percha cones. Figure 4 illustrates apical periodontal

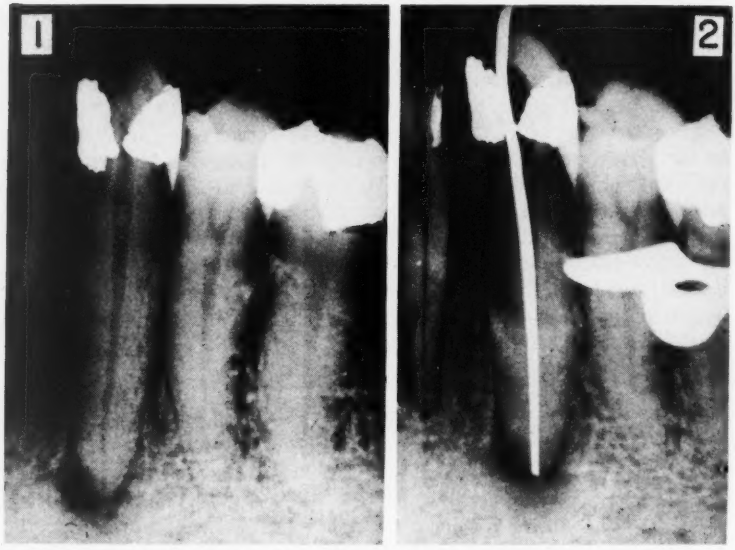

Figure 1. Diagnostic radiograph. Figure 2. Master silver cone fitted.

healing 10 months after the canal was filled, with no resort to surgical intervention. Healing occurred due to: (1) the effective-

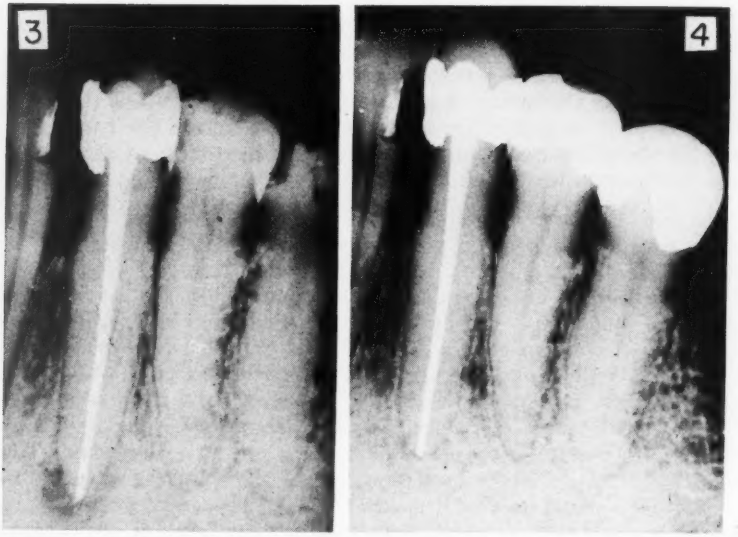

Figure 3. Root canal filled. Figure 4. Apical periodontal healing 10 months later.

ness of the endodontic therapy in eliminating the septic condition of the root canal which was the cause of the apical periodontal involvement; (2) the complete obliteration of the root canal space, and (3) the tissue-healing ability of the patient.

SUMMARY

Present-day endodontic therapy is effective in obtaining a sterile condition in a root canal that, previous to treatment, was septic. It is necessary, however, to obliterate completely the canal space after its sterile condition has been verified by bacteriologic smear and culture tests and by favorable clinical signs. Simplified and effective procedures for filling root canals have been presented.

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Construction of Dentures

If the dentist is to feel lasting satisfaction with the immediate dentures which he makes, their construction must be planned to give the patient long-range service. At present too many immediate dentures are planned for temporary service only. In many cases, therefore, the dentures give temporary rather than permanent service. The patient's apparently quick facility in using the immediate dentures, especially an upper denture, deceives many patients and dentists. Trouble manifests itself slowly with a hypertrophied anterior ridge, soreness, and a loss in the stability of the dentures. Too often the dentist is confused about his final obligation to the patient. He seems to like the first phase of the work and to dislike the follow-up reconstruction. Consequently, the construction of many immediate dentures reaches only the insertion stage, and the dentures are never fully completed.

—MERRILL G. SWENSON, D. D. S.
in *Journal of the American Dental Association,* p. 550, Nov. 1953

CAREER PLANNING FOR THE ARMY NURSE

HARRIET H. WERLEY, *Major, ANC, USA*

SINCE 25 June 1952, the same principles and procedures of career management have been applied to the Army Nurse Corps as are found in effective operation for the other corps of the medical service.

Career planning implies guidance in the movement of an officer from positions of least responsibility to those of greatest responsibility, and early proper classification of personnel is necessary. Many Army nurses carried a Military Occupational Specialty (MOS) code which had been awarded locally during the war years and for which they were not qualified, especially in the supervisory and administrative groups. To correct this, MOS awards are now more restrictive and are based on the educational and experience background and the ability to perform, as evidenced by efficiency reports.

Close liaison between the personnel officer and the chief nurse is most essential, to properly record the duty performed by a nurse. That section of the Officer's Qualification Record card which calls for an indication of the duty MOS too frequently carries a broad MOS title. This often gives no indication of the clinical area in which the nurse is performing, nor of the level of her responsibility, which may range from general-duty nurse to head nurse or supervisor. Later in the officer's career this may be of prime importance to change her classification based on her experience. The record is much more meaningful if it reflects her duty as: MOS 3449 nurse general duty, orthopedic ward, or MOS 3449 head nurse, cardiology ward, or MOS J3449 supervisor, medical service, and so on.

The matter of properly crediting the officer with duty performed is equally important when rendering efficiency reports, and entries on the officer's WD AGO Form 66 and Item 10 of DA AGO Form 67-3 should correspond.

A career guidance card specifically adapted to nursing has been designed, and when completed will present valuable infor-

From Office of The Surgeon General, Department of the Army, Washington, D. C.

mation on each Regular Army nurse. This card will be particularly useful regarding advanced training and will reflect preferences, present assignment, and a future assignment which is planned in terms of experience indicated necessary to round out a career.

Career patterns have been drafted. Comments, suggestions, and constructive criticism are solicited from nurses and some of their ideas may be incorporated in the final drafting of career progression patterns.

Policies and procedures pertinent to the army school system are put into effect by the career guidance section. For career courses, selections are made from established eligibility lists. The Nursing Administration Course of the Medical Field Service School is a career course and nurses do not need to apply to attend it. The officer's preference card, submitted in the fall of one year should reflect the educational preferences of each nurse for the next year's activities because the preference cards are used for this purpose.

In August 1953 an intermediary course was started to properly prepare the Regular Army company grade officers to assume head nurse-supervisory responsibilities.

For the first time, a block of field work, under the joint supervision and direction of the nursing instructor staff at the Medical Field Service School and the supervisory staff of Brooke Army Hospital, will be given annually to selected nurses to prepare them for duties of a head nurse and supervisor. This type of learning experience will compare favorably with courses given in a university in which field work is accorded students as part of the degree program requirements.

The professional nursing specialty courses, such as neuropsychiatric nursing, anesthesiology, and operating room technic and management, are open to qualified applicants. The same is true of courses at civilian institutions. Nurses attending civilian institutions will be predominately those who will major in nursing education and trained for teaching assignments in the service schools. A few may be assigned in the areas of nursing research and personnel administration.

Surveys and studies have been made analyzing the Army Nurse Corps membership in terms of age groups and educational level, both military and civilian. From these, our training needs will be determined and a sound plan will be made for the orderly progression of officers through service schools and civilian educational institutions, aiming to equitably allocate these privileges.

A study in the fall of 1952 revealed that 350 (23 percent) of all Regular Army nurses in the 35- to 39-year age group had never

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attended a service school, as opposed to 329 (7.9 percent) of all Reserve nurses in the same age group.

Eligibility lists for service career courses are being established, and because career guidance connotates looking to the future, emphasis will be placed on developing the 30- to 39-year age group. This is sound for several reasons: (1) it is in keeping with the Army philosophy of expeditiously educating the young outstanding officers; (2) it means preparing officers for a position prior to being thrust into it; (3) it is presumed job satisfaction will be increased; (4) it will prevent that group reaching the maximum age without the benefit of proper career training; (5) the service will get the individual's greatest contributions earlier in her career and for a longer time; and (6) youth will know it is recognized in the Army Nurse Corps and, seeing challenging positions within future reach, will continue to render competent performance and grow in stature.

Giving youth an opportunity in the Army Nurse Corps may help the procurement of young nurses for the Regular Army. The survey quoted above also revealed that there were 48 nurses (3.2 percent) in the Regular Army below the age of 30 while there were 1,116 (28.2 percent) in the Reserve Corps on active duty below the same age.

At this point, it is impossible to go back and give those in the 40- to 50-year age group school opportunities which rightfully might have been theirs a number of years ago had a career planning program then been in effect. This group must be most generous in their understanding of the situation at hand and in their support of the necessary step to prepare tomorrow's leaders. Training opportunities will also be available to the older group in the form of an occasional short course, workshop, or institute, but mainly through developmental assignments and individual initiative. Many of these now hold the grade and position of leadership and have the ability and will to keep abreast of developments.

Appropriate preparation of members of the Army Nurse Corps is essential if they are to assume the proper responsibilities in administering excellent nursing care to patients. Those occupying key positions must be prepared to make contributions to improved patient care and staff development. In an agency whose mission is service career development consists essentially of in-service education and on-the-job practical training. This demands good leadership at all installations. As the nursing profession is growing in professional stature it becomes increasingly essential that Army Nurse Corps officers compare favorably with their civilian counterparts. Critical shortage of personnel and emphasized economy unfortunately preclude giving all the necessary

training on a full-duty status. Every effort must be made to capitalize on off-duty study opportunities.

Every assistance and guidance will be given the nurse in her choice of accredited schools from which she may take suitable courses, so that her accomplishment, such as her attainment of the two-year level, the baccalaureate level, and the master's level or beyond, may be recorded officially on the WD AGO Form 66. Reserve officers too, are interested in having their level of accomplishment recorded.

All nurses are eligible to take the Graduate Nurse Qualifying Examination, and universities with departments or schools of nursing allow varying amounts of college credits for successfully passing these examinations. Frequently, the number of semester hours earned in this way generously exceeds the 30 credits which Army regulations prescribe as the equivalent for the three-year hospital school of nursing program. Those officers who have not yet attained the two-year college educational level should take this examination under the direction of a nearby college and have the results evaluated. They may then qualify for the two-year college level education by part-time study. Once the nurse gains this primary educational objective, she may find her studies so stimulating and helpful that she will then strive for a bachelor's degree.

Arrangements for obtaining these tests may be made through the Department or School of Nursing of the college or university which will be designated to receive the results for evaluation. In some cases arrangements may also be made directly with the National League for Nursing, 2 Park Avenue, New York, N. Y., to have the tests given to a group under the guidance of a qualified psychology staff.

Type of assignment rather than specific assignment is recommended by the career guidance section. A nurse's total career record is reviewed and recommendations are made in accordance with experience gaps identified or her qualifications for certain positions. The assignment section then tries to reconcile operational requirements, the personal desires and preferences and the recommendations, or the long-range goal of development of the person.

Career planning for the Army Nurse Corps should be of great interest to all, and especially to the younger nurse. The recent graduate will find military nursing stimulating and attractive.

The Returned Prisoner of War

The family doctor, consulted by a repatriated prisoner of war, may find that experiences during internment have had deep psychologic as well as physical effects, and that the former are likely to be of special importance during the period of resettlement. The serviceman never expects capture, and the violent change, affecting every detail of his life, strains all his bodily and mental resources. He is extremely depressed on capture. Weary, hungry, and longing for rest and security, he may be treated harshly and cruelly. The daily routine in which he had an established status has vanished. The customary habits are interrupted, and his individuality is lost. He is just one more prisoner, and his survival is of no interest to his captors. But this stage soon passes. He acquires new habits of life, accepts the grim situation, hopeful that somehow he will find means of escape. The group life of the camp, the irritations, the short tempers, the hard conditions, the monotonous and often insufficient food, the indefinite nature of his internment, are offset by efforts to score off his captors, to outwit them, and by a growing comradeship. The circumstances of his past life become idealized, and he pictures the future in rosy colors. Captivity, anyhow, will not last forever; when he gets home he will live as he has never lived before. These dreams of the future are a necessary and valuable compensation.

Many soldiers, particularly professionals, experience a sense of guilt on capture. The notion that he may be regarded as an unheroic figure, because he is no longer fighting, can lead the prisoner to expect a loss of caste in the eyes of those at home. Men captured after a tough fight and when every round of ammunition has been fired are free of this thought. The feeling of guilt is always intensified by thoughtless letters from home criticizing the prisoner for his capture and mentioning his newly found safety.

Some of these returned prisoners at the difficult period of repatriation are now seeking their doctors' help. In the excitement of returning to his family, and with the prospect of realizing his dreams, the repatriated man has probably forgotten the inevitable changes that time has worked in his home and his friends. His family have been forced to deal successfully with life without him. His children or his brothers and sisters have developed new

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interests. Should his wife have left him, he faces a catastrophic situation. The gulf between fantasy and fact is often extremely painful. The limited imagination of his family fails to picture the utterly different life he has led and is unequal to the strain of surrounding the returning soldier with sufficient sympathy. When the early days of home-coming have passed, the serviceman may get the impression that in some way he has failed. The thought of personal guilt is repressed, becomes unconscious, and is projected. Then there come scathing remarks about politicians, employers, and those who in the security of home have become prosperous. The returned prisoner often has difficulty in resuming the daily financial responsibilities from which he was for a time free. In addition, his working skills may be impaired. In this atmosphere he may become aggressive, apathetic, or depressed, and perhaps alcoholic. Some even drift into crime as offering more excitement and a short cut to affluence. The problem of housing often intensifies the depression and resentment. Psychoneurotic symptoms—a fear of confined spaces, of crowds, of social occasions—may appear, and a tendency to exaggerate physical symptoms.

The doctor does not see those who grapple successfully with their difficulties. But the wise course with the man who consults him is to attend to his physical ailments and assure him at the same time that he is a normal person whose difficulties are in large measure due to the problem of resettlement. If the patient is unresponsive to simple measures, if he remains tense and maladjusted and suffers from insomnia, it is wise to call in a psychiatrist. Every man who has been a prisoner, even for six months, will be affected by it to some degree, and those who have been interned for two years or more will suffer more severely and their resettlement will be correspondingly difficult. Prisoners in Japanese camps during the second world war, and some in Korea, were always hungry. Food became the chief topic of conversation in prison camps and prison hospitals. Hunger overshadowed other instinctive tendencies, and sexual thoughts and activities faded. Abdominal symptoms are often mentioned by such prisoners on repatriation; they are concerned about bowel movements, and complain of vague abdominal pains. Digestive troubles are to be expected with the change of diet—for example, from rice to service rations. Extreme cold was common in Korea, but usually the staple diet of Indian corn, although lacking in variety, was adequate. Considerations of this kind should be taken into account and a straightforward explanation of the symptoms given with firm reassurance that with treatment the trouble will quickly settle down. A quite unnecessary dread of impotence often follows the diminution of sexual interest. Again and again repatriated prisoners assert that they have suffered physiologic

harm and that they will never be the same men again. This fear of impotence often leads to sexual incompetence on repatriation. The origin of the fear and the fact that it is common should be explained, and the assurance that it is groundless should be given and can be given with confidence. Neurosis is rare among returned prisoners of war, and was almost unknown in the survivors of Japanese prisoner-of-war camps. Most of those released from Japanese internment were in sound physical and mental health, for the weaker had not survived. Even so, many were anxious about their health.

The difficulties of resettlement rather than the hardships of internment are likely to be the precipitating factor in neurosis. The physical complaints of young repatriated men can usually be treated on familiar medical lines, but psychologic symptoms may be persistent. The doctor should avoid comments on imaginary illness and avoid also the words prisoner of war, or prisoner, for they are unpopular with exprisoners. No reference should be made to the circumstances of capture, and even when the patient mentions the subject discussion should be brief. The doctor asked to support a claim for a disability pension should be sympathetic but cautious. A pension has inevitable charms, but its effect on character may be detrimental. The patient must be encouraged to take up his civil life without delay. At every employment exchange there is an official whose special task is to advise on any employment problem, and to give information on the training schemes available for men who want to learn a trade or to enter a profession. The period of resettlement need not be unduly difficult. It is a transitional period when timely advice and informed common sense can modify unprofitable attitudes of mind towards illness and towards society.

Use of Cortisone in Addison's Disease

Although Addison's disease is relatively rare and new cases uncommon, there are opportunities for making systematic investigations correlating biochemical and psychologic changes with therapy. Few workers have had much chance to observe the effect of cortisone in this condition. Rewarding results might reasonably be expected if clinical investigations are carefully carried out by endocrinologic and psychiatric technics prior to and following treatment with cortisone of allied compounds.

—ROBERT A. CLEGHORN, M. D.
in *Journal of Clinical Endocrinology and Metabolism*, p. 1293, Oct. 1953

MULTIPLE SCLEROSIS WITH ACUTE ONSET

Report of a Case

MYRON KASS, *Lieutenant, MC, USNR*

THE presenting symptom of acute multiple sclerosis in a 17-year-old man was a seizure of grand mal epilepsy. An acute onset of multiple sclerosis is more uncommon than a chronic, insidious onset, but an acute onset with the presenting symptom of an epileptic attack is even more unusual.[1-3] The literature reports an incidence of eight to 13 percent of cases of multiple sclerosis with one presenting symptom being epilepsy. The triad of hysteria, diplopia, and variegated neurologic signs is the commonest presenting picture encountered. The differential diagnosis between hysteria and multiple sclerosis always necessitates careful consideration.

CASE REPORT

A 17-year-old man was admitted to the hospital via ambulance on 17 December 1952 from aboard ship. He had previously been hospitalized from 1 until 10 December 1952 for osteochondrosis of the tuberosity of the left tibia.

The hospital corpsman accompanying the patient stated that he had fallen off his bunk while playing cards and was found lying unconscious on the floor. When first seen by the corpsman, the patient was on the floor and seemed to be choking on his tongue. The corpsman stated that the patient made an occasional convulsive-like movement of his arms, his pupils were alternatingly dilating and contracting, he was breathing heavily, and he had urinated during the attack. The patient responded to inhalation of spirits of ammonia but was disoriented for recent events. On admission he was conscious but appeared bewildered and gave vague answers to questions. He denied his recent hospitalization.

Physical examination revealed a well-developed, well-nourished young man in no acute distress. He appeared slightly disoriented. There were superficial lacerations on the under surface of the

From U. S. Naval Hospital, Bremerton, Wash.

chin, a small laceration was on the right side of the tongue, and a slight swelling of the left knee with subjective tenderness to palpation over the left tibial tubercle.

The neurologic examination revealed all the cranial nerves to be intact. The tendon reflexes were present and active bilaterally, and the Romberg and Babinski tests were negative. The pupils were round, equal, and reacted physiologically to light and accommodation.

A grand mal seizure was observed on the ward on 17 December 1952, within 48 hours of admission. This was observed and re-

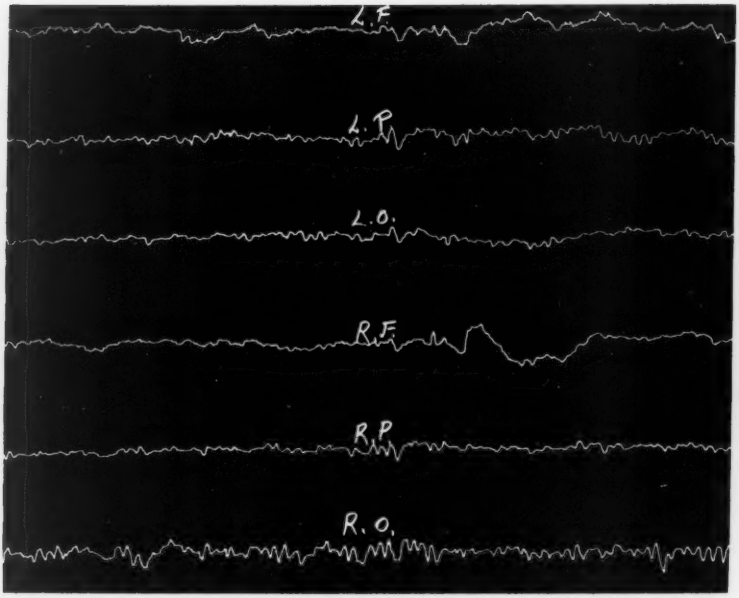

Figure 1. Electroencephalogram, taken 22 December 1952, shows a fairly normal section of basic 9/sec. activity.

corded by the medical officer of the day as a typical, generalized, grand mal convulsive seizure. No new physical or neurologic signs or symptoms were observed.

Routine laboratory examinations on 19 December 1952 and roentgenograms of chest and skull were normal. An electroencephalogram on 22 December 1952 (figs. 1 and 2) revealed a grossly dysrhythmic record with consistent bursts of high voltage and rapid β-wave activity with marked spiking which is typical of interseizure grand mal activity (fig. 2). Abnormal, slow waves were also present, but there was no indication of petit mal activ-

ity. The electroencephalogram was interpreted as an abnormal, markedly dysrhythmic record compatible with grand mal epilepsy.

On 23 December 1952 the spinal fluid was under normal pressure and was clear, colorless, and with a cell count of 10, all lymphocytes; glucose was 75 mg. per 100 cc.; chlorides were 139 mEq. per liter; the globulin was negative; the total proteins were 32 mg. per 100 cc.; and the colloidal gold was 0001000000.

The neurologic examination on 8 January 1953 revealed a staggering gait, dysphasia, and subjective diplopia. The patient complained of numbness of the right face and right arm,

Figure 2. Electroencephalogram, taken 22 December 1952, shows rapid interseizure grand mal activity with typical spiking.

which he stated had been present for the past 12 days. Marked histrionic behavior was also noted. There was a dissociation of the extra-ocular movements of the left eye, in which the left pupil lagged in all movements. A subjective hypoesthesia of the right face, right arm, and hand was present. All tendon reflexes were hyperactive but equal. The Babinski and other pathologic reflexes were not present. On re-examination on the following day, the findings were unchanged.

The patient's parents were divorced when he was 1 year old. He lived with his mother until he was 12 and after that with his

father. He stated that he knew masturbation was the cause of his "spells" and that they would not recur as he would never practice masturbation again.

On re-examination on 16 January 1953, the pupils were pinpoint but reacted slightly to light and accommodation. A marked lid lag was now present on the left. Hypoesthesia of the right face, right arm, forearm, and hand were again noted. The hyperreflexia was increased, particularly in the lower extremities. A right positive Babinski and a questionable left positive Babinski were elicited. Bilateral ankle clonus was present, being sustained on the right. His speech was markedly slurred and

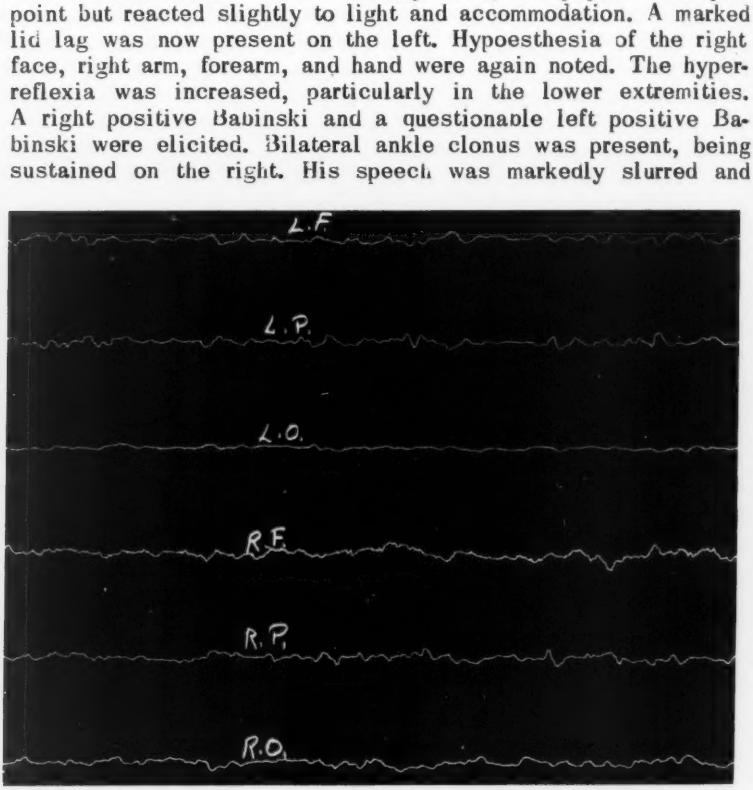

Figure 3. Electroencephalogram, taken 19 January 1953, shows marked slowing of all waves.

dysphagia was present. The gait was grossly ataxic and broad-based. Because of these conclusive findings, the diagnosis was changed to multiple sclerosis, acute, on 20 January 1953.

Between 16 and 20 January 1953 the patient became weaker, more ataxic and in-co-ordinated, and required bed care, feeding, and continual nursing care. An electroencephalogram on 19 January 1953 was not readable due to his inability to co-operate. In the first few tracings, a marked slowing of all waves was noted (fig. 3). On 20 January 1953 the spinal fluid was clear and colorless with a cell count of zero; the initial pressure was 190 mm. of water; the dynamics were free; and the closing pressure

was 120 mm. of water. Glucose determination was 74 mg. per 100 cc. and the chlorides were 133 mEq. per liter; total protein was 32 mg. per 100 cc.; globulin was negative; and the colloidal gold was read as 11111100000. On 10 February 1953 the patient was transferred to the U. S. Naval Hospital, Oakland, Calif. for further treatment and disposition. There he displayed weakness of all extremities with athetoid movements of the right arm and hand, lateral slow nystagmus, no movement of either eye nasally beyond the midline, and diminished sensation in the right face, arm, and leg. The spinal fluid contained 83 mg. per 100 cc. of protein but was otherwise not remarkable. Roentgenograms of the chest and skull and an electroencephalogram were all normal. On 25 March 1953 a blood sample for virus studies was reported negative for all encephalitides including western equine, St. Louis, mumps, and Japanese varieties. The patient's subsequent hospital course was afebrile and characterized by gradual improvement. Although grossly ataxic, he was able to walk without assistance. The diplopia improved but was marked. On 17 February 1953 the patient was examined by a consultant neurologist, who noted bilateral third cranial nerve paresis, pyramidal tract and cerebellar signs, and scanning speech. He expressed the opinion that although seizures in multiple sclerosis are exceedingly rare, this is the most likely diagnosis.

SUMMARY AND CONCLUSIONS

In a patient with acute multiple sclerosis, with grand mal seizures as the initial symptom, there was a lack of significant spinal fluid findings. Fifty percent of patients with multiple sclerosis have an abnormality of the spinal fluid, and 25 percent show a first-zone elevation of the colloidal gold curve (paretic type curve).[4-6] In the electroencephalogram presented, only a grand mal interseizure record is evident. No discernible pattern of activity has yet been established for multiple sclerosis.[7-8]

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PERFORATION OF THE ILEUM BY A CHICKEN BONE

Report of a Case

GEORGE B. MARKLE, *Captain, MC, USA*

ALTHOUGH most swallowed foreign bodies pass through the gastrointestinal tract unrecognized, occasionally one will impact and perforate, producing an acute surgical condition. The rarity of this accident explains why it is frequently not diagnosed prior to laparotomy. The case here presented demonstrates some of the problems confronting the diagnostician in such circumstances.

CASE REPORT

A 72-year-old woman, with known arteriosclerotic heart disease and a history of one coronary occlusion in 1950, was admitted to this hospital at 2300 hours on 24 February 1953 in severe distress. Nausea and cramping epigastric pains had begun that morning, later becoming constant, diffuse, and more severe. Her bowel movements had been regular, but the night before she had taken milk of magnesia, producing a normal stool that morning. She had vomited food once during the day and again on admission.

An appendectomy and left oophorectomy had been performed in 1914 and either a cholecystostomy or cholecystectomy for gallstones in 1938. She had had osteoarthritis in recent years.

The patient was obese, was unable to sit or bend forward comfortably, and had severe abdominal pain on moving her body. Her temperature was 98.4° F.; pulse, 76; and respirations, 18. The thyroid gland was enlarged bilaterally and had a nodule at the isthmus. Generalized abdominal tenderness, more marked in the right upper quadrant, was present. There was no rigidity, distention, tympany, or increased peristalsis. Rectal and pelvic examination findings were normal.

The white blood cell count was 22,000 with 85 percent neutrophils; the urine was normal except for a trace of albumin; icteric index was 9 units, and cephalin cholesterol flocculation test and the serologic test for syphilis were negative. An electrocardio-

From U. S. Army Hospital, Fort Monroe, Va.

gram revealed no change from a recent previous one. Roentgenograms of the abdomen showed no abnormalities.

During the next 24 hours the temperature spiked to 101° and 102° F., the pain and tenderness began to localize in the right lower abdominal quadrant, and was accompanied by rebound tenderness and contralateral rebound phenomenon. The decision to operate was made in spite of the known risk, based on a diagnosis of ruptured viscus.

A perforation of the ileum due to the sharp end of a chicken bone (fig. 1) was found at operation. There was local peritonitis and apparently little tissue reaction to wall off the infected site. The bone, 4.7 cm. long, was easily removed and the perforation and abdomen were closed without drainage.

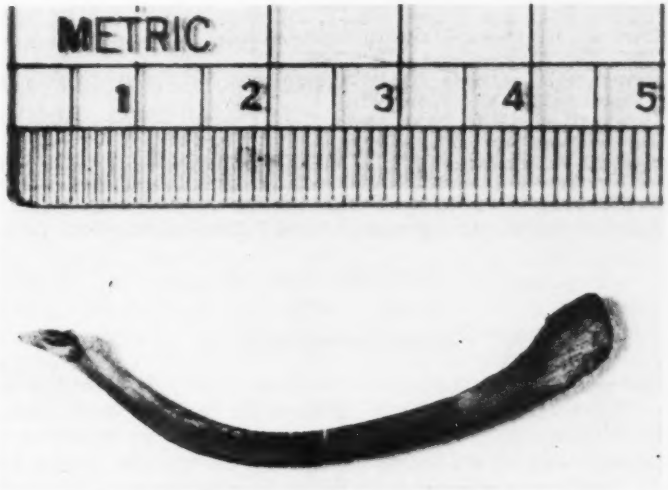

Figure 1. Chicken bone found perforating the ileum.

Re-examination of the roentgenograms showed a faint shadow of the bone missed on previous examination. When questioned, the patient remembered eating chicken two days before admission but did not recall swallowing the bone.

Postoperatively the patient's course was uneventful with rapid recovery, marred only by increase in severity of her symptoms of osteoarthritis.

COMMENT

This patient presented many of the features mentioned in the literature.[1-5] Failure of recognition of the object ingested,

possibly due to dentures, the crampy pains followed by symptoms of peritonitis, and the history of a laxative, all fit in with the usual course of events. In retrospect, it is possible that with a higher index of suspicion, the bone would have been noticed on the roentgenogram, the diagnosis made, and the operation performed at once.

SUMMARY AND CONCLUSION

Sharp foreign bodies perforating the gastrointestinal tract may be the cause of generalized peritonitis or localized abscess. This process often occurs in the absence of any history of swallowing a foreign body. A preoperative diagnosis is seldom made unless the patient knows he has swallowed a sharp object. Laxatives are contraindicated in patients suspected of having swallowed foreign bodies. A higher index of suspicion is urged.

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Low Maternal Mortality

Maternal mortality throughout the United States has been reduced from 79.9 per 10,000 births in 1920, to 20 in 1945, and to the low figure of 7 in 1952. Physicians are striving, however, to reduce this percentage still further. During the last eight years, from 1945 to 1953, 14,501 mothers have been delivered at Seaside Memorial Hospital in Long Beach, Calif., without a single maternal death from obstetrical or any other cause. Seaside Memorial Hospital is a 370-bed general hospital, with a 40-bed obstetrical service. The patients were cared for by more than 118 physicians, 35 of whom were interns. The 14,501 deliveries include 731 cesarean sections, an incidence of 5 percent. The average maternal death rate throughout the United States for this same period was 12.9 per 10,000 births, or 18.7 deaths in 14,501 deliveries.

—STIRLING PILLSBURY, M. D.
in *California Medicine*, p. 343, Nov. 1953

MECKEL'S DIVERTICULUM

Report of an Unusual Case

WILLIAM F. HUGHES, *Lieutenant, MC, USN*

MECKEL'S diverticulum is the most common developmental abnormality of the intestinal tract. According to Shallow and his associates[1] and Bigelow and Clark,[2] it is found in 1 to 2 percent of all autopsies. About 25 percent of the persons with this anomaly become symptomatic or have complications during their life, the average age for its clinical discovery being 25 years.

The complications of Meckel's diverticulum are inflammation, ulceration, intestinal obstruction, intussusception, torsion, hemorrhage, presence in a hernial sac, and tumor or fistula at the umbilicus.

The diagnosis is usually made at operation, as only 25 percent of the patients with Meckel's diverticulum have symptoms. When present, the symptoms and signs may simulate acute appendicitis or intestinal obstruction.[3] Occasionally there is bleeding, which is a very serious complication, particularly in infants or young children. Bleeding from the lower bowel, often severe in amount and lacking other demonstrable cause, is most apt to be coming from a Meckel's diverticulum even in the absence of abdominal complaint. Rarely, there is noted a reddened area in the umbilicus which may represent an opening of the vitelline duct and by means of which the diagnosis may be made by injecting opaque media.

During surgical intervention, should the cause of the patient's symptoms not be found, a diligent search should be made for a Meckel's diverticulum. It should be removed, providing the patient's condition is satisfactory or if it is an incidental finding during other procedures, unless there are contraindications present such as severe acute inflammation of another structure, poor-risk patient, or metastatic malignancy.[4]

The recommended procedures are to clamp the Meckel's diverticulum at its neck, remove it, and suture the defect; or,

From U. S. Naval Hospital, Oakland, Calif.

to remove it by a complete resection, particularly if the distal portion is ulcerated or if aberrant tissue is palpated within the diverticulum. Inverting the Meckel's diverticulum is dangerous because if heterotrophic tissue is present it will cause future symptoms, or the inverted diverticulum may form the leading point of an intussusception.

CASE REPORT

A 20-year-old white male was admitted to this hospital on 16 March 1953 with an undetermined diagnosis of strangulated hernia. He had a 33-hour history of generalized, intermittent,

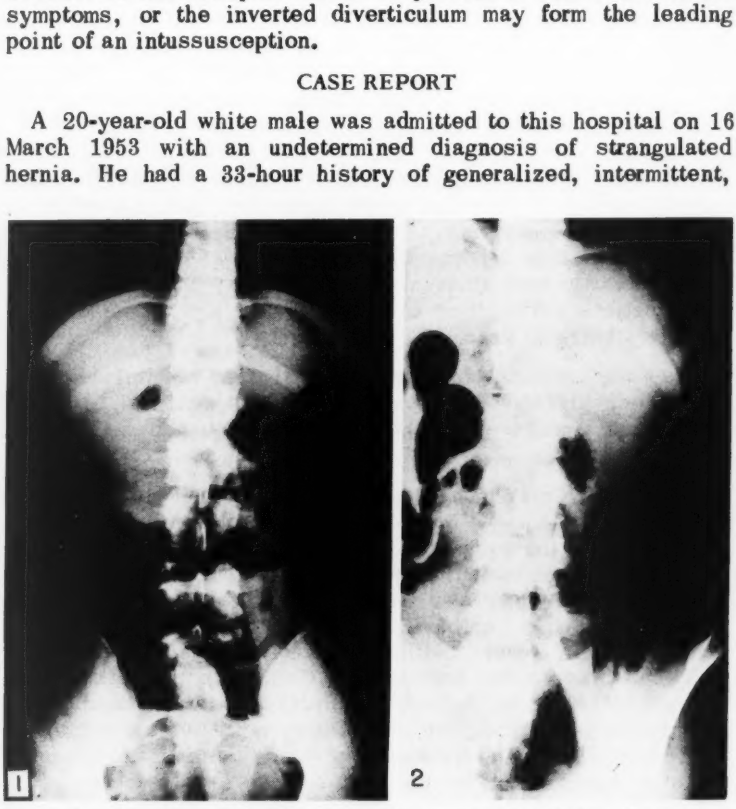

Figure 1. Roentgenogram, taken in upright position just before the patient was operated on, reveals dilated loops of small bowel with fluid levels, separation of the intestinal loops, and absence of air in the large intestine. Figure 2. Roentgenogram, taken in a lateral decubitus position, demonstrating identifying signs of intestinal obstruction.

sharp, nonradiating, abdominal pain associated with nausea and vomiting. He had had one normal bowel movement the day prior to admission.

Physical examination revealed an individual not in acute distress, with a normal temperature and pulse. There was minimal tenderness in the abdomen, peristaltic sounds were present and hyperactive, but no high-pitched sounds were heard.

Both inguinal areas were free of hernias. The white blood cell count was 12,600 with 71 percent neutrophils.

The patient was observed for two days without any complaints or physical findings that were alarming. His temperature remained normal. A roentgenogram of the abdomen was taken, but it was technically unsatisfactory. On 18 March 1953 the white blood cell count was 8,200 with 85 percent neutrophils.

On the evening of 18 May 1953 the patient complained of abdominal pain. Examination revealed him to be uncomfortable, but not in acute distress. There was slight abdominal distention and generalized tenderness, and loops of bowel were palpable and visibly indenting the anterior abdominal wall. Peristaltic rushes and high-pitched sounds were present. Roentgenograms of the abdomen (figs. 1 and 2), taken en route to surgery, showed characteristic findings of intestinal obstruction con-

Figure 3. Photograph of the Meckel's diverticulum, taken shortly after its removal, showing its size. The lumen was patent to 1 cm. from the tip.

sisting of dilated loops of small bowel, absence of air in the large bowel, fluid levels, and separation of the loops.

At operation an estimated 400 cc. of turbid, milky fluid were aspirated from the peritoneal cavity. Several loops of small intestine, which were edematous and dilated to about three times the normal diameter, were retracted medially, exposing a collapsed terminal ileum. This was followed proximally for about 90 cm. During this process a volvulus, consisting of a loop of ileum winding itself along a Meckel's diverticulum, was reduced. The diverticulum had a base about 3 cm. wide, was about 10 cm. long, and narrowed to a fibrous cord, covered with peritoneum, which was attached to the anterior abdominal wall at the umbilicus. Clamps were placed across the base of the diverticulum in a longitudinal manner, and it was excised. The

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resulting defect in the antimesenteric surface of the ileum was closed transversely with two running loop-on-the-mucosa sutures of No. 00 chromic catgut. The attachment of diverticulum to the anterior abdominal wall was severed immediately beneath the umbilicus, the resulting defect being closed with mattress sutures of No. 0 chromic catgut, and the abdominal incision closed in layers.

The postoperative course was complicated by the development of a wound abscess which required incision and drainage.

The pathologic report showed the Meckel's diverticulum (fig. 3) to be 10 cm. in length and to be patent to within 1 cm. of the distal end. There was no aberrant tissue noted within the lumen.

DISCUSSION

Such a long history of intestinal obstruction (66 hours), confirmed by physical findings of distention, palpable loops of bowel indenting the anterior abdominal wall, roentgenographic evidence of dilated loops of small intestine separated by fluid, and operative findings of turbid fluid in the peritoneal cavity, but with no gangrene of the intestine, is difficult to understand. Probably the obstruction was incomplete until 24 hours prior to surgery. The paucity of complaints and symptoms elicited from the patient is unusual.

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Adequate Diet for the Aged

The tendency to anorexia in old age is a phenomenon deserving further study. While it is not yet clear what percent of old patients exhibiting general weakness in the absence of demonstrable disease is due to prolonged malnutrition, certainly the importance of an adequate diet as a prophylactic measure against senile debility deserves emphasis.

—From *Nutrition Reviews*, p. 273, Sept. 1953

A Message From the A. M. A.

EDWARD J. McCORMICK, M. D.
President, American Medical Association

It is a distinct pleasure for me to announce the beginning of a regular series of articles in the United States Armed Forces Medical Journal entitled "A Message from the A. M. A." In this first issue I wish to explain why this column has been initiated and the material it will cover. In addition, I want to express my sincere thanks to Dr. Melvin A. Casberg, Assistant Secretary of Defense (Health and Medical), Colonel Robert J. Benford, the editor of the *Journal,* and to all others who are making this series possible.

It became clear to me shortly after I was installed as the President of the American Medical Association, that there was a need for closer communication between organized medicine and the physician in uniform. The many letters which I received from men in service and the military developments in Korea and other parts of the world recalled to mind some of my own reactions while in uniform.

I remember, as will any man who has been in service, the feeling we all experienced that we were "out of touch" and that we were being forgotten by our friends and colleagues at home. Upon checking with the Association's Council on National Emergency Medical Service, I found to my satisfaction that physicians in the armed services have not been forgotten or neglected by their national professional society.

Since its activation in 1947, the Council has maintained a close and constant liaison with the armed services and with the Department of Defense and has engaged in a series of projects all designed to benefit the physician in service and to insure the highest quality of medical care for military personnel. After further discussion, it was agreed that a method should be devised to facilitate the communication of this information to the individual doctor in the service.

I originally suggested that the Council publish and distribute a monthly newsletter to keep physicians in the armed services fully informed as to the activities of the Association in their behalf, and on current developments in the various fields in which they are interested. Administrative difficulties and security

regulations made this approach unfeasible. Consideration was also given to dedicating a section of the *Journal of the American Medical Association* to the subject; however, the limited nature of its circulation to service personnel suggested the need for another approach. It was then that an offer was made to permit the use of the *United States Armed Forces Medical Journal* for this purpose.

Beginning next month, and each month thereafter, the Council on National Emergency Medical Service will outline one of its projects, present a subject of current interest to physicians in uniform or answer questions which have been submitted. To a large extent, the items discussed will depend on the nature of inquiries currently being received by the Council. Therefore, if there is any subject which you would like to have discussed, I suggest that you write directly to the Council on National Emergency Medical Service, American Medical Association, 535 North Dearborn Street, Chicago 10, Ill.

You appreciate, I know, that the views expressed in this and later editions of the column are those of the American Medical Association and not necessarily those of the armed services or the Department of Defense.

I know I speak for the Council and for all of the officers of the Association in pledging continued active interest in medical military affairs in the immediate and postservice problems of physicians in uniform. If there are ways in which you believe we can be more effective in fulfilling our obligations in this regard, let me assure you that your suggestions will be most welcome.

An electron within the cancer cell remains the only goal of radiation, but the new avenues of research which have been opened by the rapidly increasing number of radioactive isotopes have greatly enhanced the markmanship. There is still work to be done: investigation of ray emitters which will destroy tumor cells only, finding a way to produce more even distribution of radiation within the tumor, and extensive clinical investigation in use of supervoltage treatment. Radiation therapy is playing a great part in the battle on cancer. It is constantly opening new avenues for successful treatment of this disease.

—GILBERT J. FLETCHER, M. D.
in *Cancer News*, p. 8, Jan. 1953

Official Decorations

SILVER STAR

Daniel W. Clark, *Lt. (jg), USNR*

William R. Downey, II, *First Lt., MC, USA*

LEGION OF MERIT

William W. Ayres, *Comdr., MC, USN*
Robert A. Boyce, Jr., *Col., VC, USA*
Joseph Di Giacomo, *Lt. Col., MSC, USA*
Ray V. Grewe, *Lt., MC, USNR*
Eugene R. Hering, *Capt., MC, USN*
Warren E. Klein, *Capt., MC, USN*
William E. Ludwick, *Comdr., DC, USN*
George M. Powell, *Col., MC, USA*
Carl J. Welge, *Lt. Col., MC, USA*

NAVY AND MARINE CORPS MEDAL

Samuel A. Youngman, *Lt. (jg), MC, USNR*

SOLDIER'S MEDAL

Gerald S. Modjeska, *First Lt., MC, USA*

BRONZE STAR MEDAL

Joseph L. Ackerman, *First Lt., MC, USA*
Thorwald R. Anderson, *Maj., MC, USA*
Robert E. Baker, *Capt., MC, USN*
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George O. Clifford, *First Lt., MC, USA*
Ramon L. Collazo, *First Lt., DC, USA*
Edwin B. Coyl, *Capt., MC, USN*
John F. Currin, *Lt. (jg), MC, USNR*
Leo T. Delaney, Jr., *Lt. (jg), MC, USNR*
Robert L. Dow, *Lt. (jg), MC, USNR*
Lyle H. Edelblute, *Lt. Col., MC, USA*
Elizabeth T. Fanchalsky, *Capt., ANC*
James F. Fitch, *Lt. (jg), MC, USNR*
Roy N. Fouch, *First Lt., MC, USA*
John W. Gaddis, *First Lt., MC, USA*
Donald R. Gilbert, *Capt., MC, USA*
Harrold E. Graham, *Maj., MSC, USA*
Roscoe Gutekunst, *Lt., MC, USNR*
Henry L. Hammond, *Capt., MSC, USA*
Wilburn C. Hawkins, *First Lt., MC, USA*
Calvin M. Herring, *First Lt., DC, USA*
Ferris G. Hodge, *Lt. Comdr., DC, USN*
Raymond L. Hyder, *First Lt., MSC, USA*
Royce V. Jackson, *First Lt., MSC, USA*
Howard A. Johnson, *Comdr., MC, USN*
Estelle E. Kalnoski, *Lt. Comdr., NC, USN*
Lawrence O. Keelan, *CWOHC, USN*
Cletus E. King, *Capt., MSC, USA*
William A. Kornblum, *Lt. (jg), MC, USNR*
William E. Larsen, *Lt. (jg), MC, USN*
Joseph B. Legrand, *Capt., MC, USA*
Lloyd T. Lorbeer, *Capt., MC, USA*
Thurlow W. Matteson, *2d Lt., MSC, USA*

This new feature is inaugurated in this issue as a regular department of the *Journal*. The names of officers of the medical services who have been awarded decorations by the United States Army, Navy, or Air Force since the beginning of the Korean campaign will be published following receipt of this information from official sources.—*Editor*

BRONZE STAR MEDAL—Continued

Charles D. Miller, *Lt. (jg), MC, USN*
John G. Morris, Jr., *Col., MSC, USA*
Dewey A. Nelson, *First Lt., MC, USA*
Robert Orlikoff, *First Lt., MC, USA*
William A. Pacey, *Maj., MSC, USA*
Robert E. Page, *Lt. (jg), MC, USN*
Harold Pessin, *Capt., DC, USA*
James K. Pope, *Capt., MC, USA*
Harold D. Reinhardt, *Capt., DC, USA*
Peter G. Robbins, *Lt., MC, USNR*
Raymond A. Romanski, *Capt., MC, USA*
Andrew J. Sanchez, *Lt. (jg), MC, USNR*
Robert Schick, *Maj., MSC, USA*
Jose A. Semidey, *First Lt., MC, USA*
James G. Sites, *First Lt., MC, USA*
Ralph B. Smith, *Maj., MC, USA*
Arthur H. Stein, Jr., *Lt. (jg), MC, USN*
Gilbert B. Strong, *First Lt., MSC, USA*
Emmett N. Thomas, Jr., *Capt., MSC, USA*
Richard P. Turk, *Capt., MSC, USA*
John H. Walsh, *First Lt., MSC, USA*
Charles M. Weinert, *First Lt., MSC, USA*
Richard E. Wilson, *First Lt., MC, USA*
Martin Zuckoff, *First Lt., MSC, USA*

AIR MEDAL

Sherman H. Bruckner, *Lt. (jg), MC, USN*
Calvin T. Doudna, *Comdr., MC, USN*
Donald D. Hillan, *Lt., MC, USNR*
Howard A. Johnson, *Comdr., MC, USN*
Louis P. Kirkpatrick, *Capt., MC, USN*
Warren E. Klein, *Capt., MC, USN*

COMMENDATION RIBBON

William C. Adams, Jr., *Lt. (jg), MC, USN*
James A. Addison, *Comdr., MC, USN*
Althea E. Allgeier, *Lt., NC, USN*
Roy J. Atkinson, *First Lt., MC, USA*
William H. Bassett, *CWOHC, USN*
John F. Benson, *Capt., MC, USA*
John O. Booth, *Comdr., DC, USN*
Leon R. Briggs, Jr., *Lt. (jg), MC, USN*
Alberta S. Burk, *Lt. Comdr., NC, USN*
Don L. Carlisle, *Lt. (jg), MC, USNR*
Sarah J. Chapman, *Lt., NC, USN*
Thomas L. Curtin, *First Lt., MSC, USA*
Louis E. Dean, *Lt., MSC, USN*
Robert A. Dietzschold, *Capt., DC, USA*
Raphael H. Duncan, *Capt., MC, USA*
Paul J. Elkowitz, *Capt., MSC, USA*
John H. Eves, *First Lt., MC, USA*
Evan S. Farrington, *Lt. (jg), MC, USNR*
John A. Gatz, *First Lt., MSC, USA*
Robert B. Giles, Jr., *First Lt., MC, USA*
Robert H. Gregg, *Lt., MC, USNR*
Edward F. Gudgel, *Maj., MC, USA*
Joseph M. Hanner, *Comdr., MC, USN*
Arvin T. Henderson, *Lt. Comdr., MC, USN*
Raymond L. Horton, *Second Lt., MSC, USA*
Burt C. Johnson, *Lt., MC, USNR*
Frank F. Kalchuk, *Lt. Comdr., MC, USN*
Donald C. Kent, *Lt. (jg), MC, USN*
Jan F. King, *Lt. Comdr., DC, USN*
George E. Kirkpatrick, *Capt., MSC, USA*
Carl J. Koehn, *Lt. Col., MSC, USA*
Raymond J. Krause, *Lt. (jg), MC, USNR*
Quentin L. Larson, *First Lt., MSC, USA*
Roy H. Ledbetter, Jr., *Lt., MC, USNR*
Thomas C. Leinbach, *Lt. (jg), MC, USNR*
Richard E. Luehrs, *Lt., MC, USN*
Ernest J. Magnus, *First Lt., MSC, USA*
Robert L. Marske, *Lt. (jg), MC, USNR*
Malcolm D. McGeary, *Lt., MC, USN*
Richard C. Melick, *Lt. (jg), MC, USNR*
Paul M. Mitchell, *Lt. (jg), DC, USNR*
George C. Morrison, *First Lt., MC, USA*
Ray B. Mueller, *Lt., DC, USN*
James B. Neville, *Lt. (jg), MC, USNR*
Charles W. O'Brien, *CWOHC, USN*
Wallace R. Paull, *First Lt., DC, USA*
Paul B. Paynter, *First Lt., USAF (MSC)*
Ralph L. Pfister, *Capt., MSC, USA*
Richard C. Powers, *Lt. (jg), MC, USNR*
Louis E. Rector, *Comdr., MC, USNR*
Dick E. Reed, *WOJG, USA*
Clifford H. Rice, *Comdr., DC, USNR*
John T. Rogers, *Lt. (jg), MC, USNR*
Elmer J. Schewe, Jr., *Lt. (jg), MC, USNR*
Phillip Schneider, *Lt. (jg), MC, USNR*
Harold S. Shuler, *Lt. (jg), MC, USNR*
Marvin L. Slomowitz, *First Lt., MSC, USA*
Earnest A. Sneddon, *Lt., MC, USN*
Vernon C. Sorensen, *Capt., MSC, USA*
Roger R. Starn, *First Lt., MSC, USA*
Harold Sussman, *First Lt., MC, USA*
Edwin C. Tait, *Lt., MC, USNR*
Louis W. Tennyson, Jr., *1st Lt., MSC, USA*
Joseph O. M. Thatcher, *Comdr., MC, USN*
Kenneth J. Tobola, *First Lt., MSC, USA*
Robert B. Tribe, *Lt. (jg), DC, USNR*
Henry O. Trowbridge, *Lt. (jg), DC, USNR*
Frank D. Virgilio, *Comdr., MC, USN*
Daryle A. Wade, *Lt., MSC, USN*
Robert H. Ward, *Comdr., MC, USN*

COMMENDATION RIBBON—Continued

Herbert B. Warrick, *WOHC, USN*
Frank Y. Watson, *Lt. (jg), MC, USNR*
William K. Weitzel, *Lt., MC, USNR*
William W. Wilkinson, *First Lt., MC, USA*
James M. Wilson, *Capt., MC, USA*
Edward R. Woodard, *Lt., MC, USNR*
Belton J. Workman, *Lt. (jg), MC, USN*
Paul E. Zeigler, *Lt. (jg), DC, USN*

PURPLE HEART

William A. Boyson, *Capt., MC, USA*
Harry H. Clark, Jr., *First Lt., MC, USA*
Ambrose H. Clement, *First Lt., MC, USA*
Ramon L. Collazo, *First Lt., MC, USA*
Nicholas S. Comitos, *2d Lt., MSC, USA*
Donald A. Degler, *Second Lt., MSC, USA*
Raymond N. Duggan, *First Lt., MSC, USA*
Samuel R. Frazier, *First Lt., MC, USA*
Erik Larsen, *Capt., MC, USA*
John C. McKissick, *Col., MC, USA*
Robert E. Smith, *Second Lt., MSC, USA*
Milton H. Stern, *First Lt., MC, USA*
Joseph Suchenski, *Second Lt., MSC, USA*

Responsibilities of an Officer

The professional military man has three primary responsibilities: First, to give his honest, fearless, objective, professional military opinion of what he needs to do the job the Nation gives him. Second, if what he is given is less than the minimum he regards as essential, to give his superiors an honest, fearless, objective opinion of the consequences, as he sees them from the military viewpoint, of this shortage, and third and finally, he has the duty, whatever be the final decision, to do the utmost with whatever he is furnished.

—From remarks by General MATTHEW B. RIDGWAY, USA
on assuming the duties of Chief of Staff, U. S. Army

For this generation there is no sane alternative but to accept with courage and determination the realities of a new era. The time for courage, and determination and action, even, it may be, for martyrdom, is now; the place is here, wherever we may be and whatever our responsibilities at the moment. Every action, every word, works for or against the great ideal of peace on earth. We, the peoples of the world, not only in the councils of the nations, but, far more importantly, in our daily living, will decide whether we and our children will live and die in misery and fear far worse than anything we have known, or whether we and they can construct and enjoy a happy and peaceful world community. Again: the time for action is now!

—Dr. BROCK CHISHOLM
in *Chronicle of the World Health Organization*, p. 188, Aug. 1953

Teaching or Stagnating

It is unfortunately true that in many teaching institutions participation in the teaching program is a prerequisite to professional advancement. It is also true that there are many highly qualified physicians whose interest in teaching is negligible. If these men are forced into a position of teaching or stagnating they will choose the former. But it would be unrealistic to expect brilliance, or even competence from their performance. Teaching is too demanding a task to be assumed casually or irresponsibly. If it suffers because of this, then the blame must fall on administrators. This is a problem that requires the most careful consideration. Re-examination of local ground rules in the light of the requirements for successful teaching, and the time and pain necessary for its accomplishment, might result in significant improvement.

—GEORGE E. MILLER, M. D.
in *Diseases of the Chest*, p. 454, Oct. 1953

Accidents Among the Aged

Accidents are a major threat to the life of the aged, outranking every other cause of death except the cardiovascular diseases and cancer. Of the 100,000 deaths from accidents in the United States annually, about 25,000 occur among people at ages 65 and over. These elders thus contribute one fourth of all the victims of fatal accidental injury, although they comprise only 8 percent of the total population. The death rate from accidents reaches its highest level at ages 65 and over, where it is three times the rate at ages 45-64 and seven times that at ages 1-14.

Physical weakness, impaired motor function, forgetfulness, poor vision, and other infirmities of later life make the aged particularly prone to mishaps. Moreover, when these people are involved in accidents, the results are likely to be serious. At the older ages bones break rather easily and do not join very readily; burns, cuts, and other types of injury do not heal rapidly. In addition, serious complications, such as pneumonia, may set in, while chronic disease—common among the aged—may have a fatal termination.

—*Statistical Bulletin*, p. 5, Oct. 1953

Regular Medical Corps Officers Certified by Specialty Boards

American Board of Dermatology and Syphilology

This board was activated in 1932 to certify qualified physicians in this field of practice. The following 34 regular Medical Corps officers, according to the Offices of the respective Surgeons General, are diplomates in this specialty:

John W. Albrittain, *Comdr., USN*

Charles D. Bell, *Capt., USN*

John H. Cox, *Comdr., USN*

Calvin B. Galloway, *Capt., USN*
Bernard G. Geuting, *Comdr., USN*
Gordon E. Gifford, *Capt., USA*
Robert L. Gilman, *Capt., USN*
Franklin H. Grauer, *Col., USA*
Edward F. Gudgel, *Maj., USA*
Marshall B. Guthrie, *Lt. Col., USA*

Vinton Hall, *Comdr., USN*
Earl S. Hallinger, Jr., *Lt. Col., USA*
Robert S. Higdon, *Col., USA*
Victor R. Hirschmann, *Col., USA*

Karl V. Kaess, *Comdr., USN*

Louis S. Leland, *Col., USA*
Chester M. Lessenden, *Lt. Comdr., USN*
Robert E. Lyons, *Col., USAF*

Leslie K. MacClatchie, *Capt., USN*
James F. Morrell, *Lt., USN*
Myles P. Moursund, *Lt. Col., USA*

William N. New, *Capt., USN*

Orland S. Olsen, *Lt. Col., USA*

William N. Piper, *Lt. Col., USA*
George Prazak, *Col., USA*

Sidney J. Rice, *Lt. Col., USA*
Van R. Richmond, *Lt. Col., USA*

Robert G. Thompson, *Lt. Col., USA*
Urban L. Throm, II, *Lt. Col., USA*
Ernest R. Trice, *Capt., USA*

John D. Walters, *Comdr., USN*
Claude B. White, *Col., USAF*
Raymond M. Williams, *Col., USA*
Sydner T. Withers, *Lt., USN*

American Board of Pediatrics

Since its establishment in 1933, the American Board of Pediatrics had certified a total of 4,529 physicians on 30 June 1953. These include the following 42 regular Medical Corps officers of the three military departments:

Joseph Allison, *Capt., USA*

George R. Barnes, Jr., *Capt., USA*
Bedford H. Berrey, *Capt., USA*
Frederick C. Biehusen, *Capt., USA*
Ogden C. Bruton, *Col., USA*

Arnold J. Capute, *Capt., USA*
Hugo M. Cardullo, *Capt., USA*
Thomas E. Cone, *Comdr., USN*
Bernard I. Copple, *Lt. Col., USA*
William W. Currence, *Lt. Col., USA*

This is the fourth of a series. The names of officers certified by the American Board of Psychiatry and Neurology will be published in the February issue.

American Board of Pediatrics—Continued

Thomas L. Duffy, *Comdr., USN*
John A. Duggan, *Capt., USA*

Walton M. Edwards, *Lt. Col., USA*

John P. Fairchild, *Maj., USA*

Albin Gedarovich, *Lt., USN*
Leo J. Geppert, *Lt., Col., USA*
Norman Goldstein, *Capt., USA*
Harold L. Guard, *Maj., USA*

Arvin T. Henderson, *Lt. Comdr., USN*

Jerome Imburg, *Lt., USN*

Milton Kurzrok, *Comdr., USN*

Conn L. Milburn, Jr., *Col., USA*
Joe E. Mitchell, *Capt., USA*
Ernest R. Moeller, *Comdr., USN*

William I. Neikirk, *Lt. Comdr., USN*
Joseph R. Newton, *Maj., USA*

Robert F. Newton, *Capt., USA*
John A. Norman, *Capt., USA*

Richard E. Ogborn, *Capt., USA*

Alexander C. Peat, *Maj., USAF*

John F. Shaul, *Comdr., USN*
David W. Sherwood, *Capt., USN*
Frederic E. Simpson, *Lt. Col., USA*
Mary E. Steinheimer, *Capt., USA*
Daniel Stowens, *Capt., USA*
Frank L. Swift, *Capt., USA*

John C. Traugh, *Comdr., USN*
Chester M. Trossman, *Lt., USN*

Walter B. Watson, *Maj., USA*
Dick D. Wetzel, *Capt., USA*
Sherl J. Winter, *Capt., USN*
William K. Woodard, *Lt., USN*

Early Use of Forceps in Obstetrics

The invention of the forceps was probably the most important event in the history of obstetrics, for dissemination of knowledge of the instrument, coinciding as it did with the first serious incursions of the medical profession into the realms of midwifery, gave the supremacy to the man midwife and afforded him, for the first time, opportunities for the study of normal as well as abnormal labor—a study from which all modern knowledge has come. So great an advantage did this instrument give the obstetrician of two centuries ago that it became hated by the midwives, who did everything possible to discredit it in the eyes of parturient women. It was this attitude which prompted Smellie and others of his day to use wooden- or leather-covered forceps, which, being devoid of a tell-tale metallic rattle, could be applied surreptitiously without the knowledge of either patient or handywoman.

—T. N. A. JEFFCOATE, M. D.
in *British Medical Journal*, p. 4843, Oct. 31, 1953

Publications by Officers of the Medical Services

Abrams, W. B., First Lt., MC, AUS, and Edger, H. D., Lt. Col., MC, USA: Ballistocardiographic study of healthy young adult males. *Circulation* 8: 738-743, Nov. 1953.

Beckman, E. L., Lt. Comdr., MC, USN; Ziegler, J. E., Lt., MC, USN; Duane, T. D., Lt., MC, USNR; and Hunter, H. N.: Some observations on human tolerance to accelerative stress; phase II, preliminary studies on primates subjected to maximum simple accelerative loads. *J. Aviation Med.* 24: 377-392, Oct. 1953.

Clark, B., Comdr., MSC, USNR; Nicholson, M. A., Lt. (jg), MSC, USNR; and Graybiel, A., Capt., MC, USN: Fascination; cause of pilot error. *J. Aviation Med.* 24: 429-440, Oct. 1953.

Dodge, P. R., Capt., MC, USA, and Cleve, E. A., Col., MC, USA: Backache; observations on diagnosis and management of 122 soldiers with this symptom as their chief complaint. *Mil Surgeon* 113: 376-389, Nov. 1953.

Domanski, T. J., Lt. Col., USAF (MSC), and Nuttall, J. B., Lt. Col., USAF (MC): Physiological recognition of strain associated with flying. *J. Aviation Med.* 24: 441-445, Oct. 1953.

Duane, T. D., Lt., MC, USNR: Plea for the inclusion of cover test for heterophoria in routine flight physical examinations. *J. Aviation Med.* 24: 425-428, Oct. 1953.

Endress, Z. F., Maj., MC, USAR: Traumatic mediastinal hematoma. *Am. J. Roentgenol.* 70: 576-580, Oct. 1953.

Galindo, D. L., Lt., MC, USA, and Bohls, S. W.: Combined pulmonary and central nervous system cryptococcosis; case report. *Mil. Surgeon* 113: 403-413, Nov. 1953.

Gleiser, C. A., Lt. Col., VC, USA: Mucormycosis in animals; report of three cases. *J. Am. Vet. M. A.* 123: 441-445, Nov. 1953.

Green, O., Capt., MC, USA: Tracheotomy; present-day indications and techniques. *J. Indiana M. A.* 46: 974-977, Oct. 1953.

Johnson, R. P., Col., MC, USA: Treatment of hypertension with 1-hydrazinophthalazine (apresoline). *Am. Heart J.* 46: 593-601, Oct. 1953.

Kirk, T. A., Jr., Lt. (jg), MC, USNR: Solitary diverticulitis of cecum simulating acute appendicitis. *Virginia M. Monthly* 80: 630-634, Nov. 1953.

Kuitert, J. H., Lt. Col., MC, USA, and Vultee, F. E., Capt., MC, USA: Permanent total blindness associated with severe physical disability including bilateral amputation of hands; report of case with critical evaluation of rehabilitation techniques. *Am. J. Phys. Med.* 32: 276-281, Oct. 1953.

Lazar, M. P., Capt., MC, USA: Recurrent, fixed erysipelas-like dermatophytid; ineffectiveness of antibiotics reported in case. *A. M. A. Arch. Dermat. & Syph.* 68: 574-576, Nov. 1953.

Lyons, H. A., Comdr., MC, USN: Talc pneumoconiosis. *Mil. Surgeon* 113: 393-396, Nov. 1953.

Lyons, R. E., Col., USAF (MC), and Livingood, C. S.: Laboratory test for evaluation of fungicidal solutions. *A. M. A. Arch. Dermat. & Syph.* 68: 566-571, Nov. 1953.

McManis, T. F., Col., DC, USA: Maxillofacial injuries in field. *Mil. Surgeon* 113: 390-392, Nov. 1953.

Peterson, R. E., Capt., MC, USA, and Ettinger, R. H., Capt., MC, USA: Radioactive iron absorption in siderosis (hemochromatosis) of liver. *Am. J. Med.* 15: 518-524, Oct. 1953.

Pickering, J. E., Lt. Col., USAF, and Thoma, G. E., Jr., Maj., USAF (MC): Aeromedical problems for nuclear propelled aircraft. *J. Aviation Med.* 24: 423-424, 445, Oct. 1953.

Powers, D., Capt., USAF (MC): Response of small children to psychic insult. *Neuropsychiatry* 3: 42-48, Summer 1953.

Powers, D., Capt., USAF (MC): Review of hypertrophic pyloric stenosis with emphasis on the possible emotional in etiology. *North Carolina M. J.* 14: 426-432, Sept. 1953.

Rizzolo, J., Lt. Col., USAF (MC): Importance and relation of preventive medicine to aviation medicine. *J. Aviation Med.* 24: 412-422, Oct. 1953.

Schillhammer, W. R., Jr., Capt., MC, USA: Fatal myocardial infarction in young man with anomalous coronary arteries with terminal ventricular tachycardia. *Am. Heart J.* 46: 613-615, Oct. 1953.

Sheppe, W. M., Capt., MC, USNR: Neuropathic (Charcot) joints occurring in diabetes mellitus. *Ann. Int. Med.* 39: 625-629, Sept. 1953.

Stiff, D. W. S., Maj., MC, USA, and Powell, G. M., Col., MC, USA: Roentgenologic observation in hemorrhagic fever. *Radiology* 61: 807-813, Nov. 1953.

Trice, E. R., Capt., MC, USA: Conization treatment of insect-bite granuloma. *A. M. A. Arch. Dermat. & Syph.* 68: 586-588, Nov. 1953.

Deaths

ENGELBREIT, Joseph James, Captain, USAFR (MC), Third Medical Group, Far East Air Force; graduated from St. Louis University School of Medicine in 1951; commissioned a first lieutenant July 1951; died 21 May 1953, age 25, in an aircraft accident in Korea while serving as a flight surgeon on a bombing mission.

MEISTER, Adam G., Jr., Captain, MC, USAR, 82d Airborne Division, Fort Bragg, N. C.; graduated from University of California Medical School in 1947; ordered to active duty 11 October 1952; died 17 November 1953, age 29, in an aircraft accident near Fort Bragg, N. C.

BOOK REVIEWS

Diseases of the Liver, Gallbladder and Bile Ducts, Volumes I and II, by *S. S. Lichtmann,* M. D. 3d edition, revised. 1,315 pages; 220 illustrations and 3 color plates. Lea & Febiger, Philadelphia, Pa., 1953. Price $22 for the set.

This is an extensive, excellent, and detailed compilation of the most recent data on all phases of liver disorders. The material is collected from world-wide contributors and the references are voluminous after each chapter. Over 200 pages are devoted to a discussion of cirrhosis of the liver alone. The presentation of the various types and forms of liver function tests and procedures is especially clarifying. Liver aspiration biopsy is discussed in a short but comprehensive chapter on general considerations in differential diagnosis of liver disease.

One hundred pages are devoted to viral hepatitis as part of an especially good chapter on the acute and subacute inflammatory diseases of the liver. Liver dysfunction as manifested in such diseases as hyperthyroidism and other metabolic disturbances, and in heart disease is presented in excellent manner. Liver function during various stages of pregnancy and its complications is also outlined. Because the liver is such a large and important organ, this fine work takes up that subject primarily. However, the 12 percent allotted to discussion of the gallbladder and the biliary tract is very interesting and practical to the surgeon as well as the internist.

This set of two volumes is a valuable reference work for the studious medical internist as well as the gastroenterologist.

—*Col. U. R. Merikangas, MC, USA*

Differential Diagnosis of Common Diseases of the Eyeground, by *Paul Tower.* 243 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1953. Price $10.

There are a number of features that commend Dr. Tower's new textbook to students and practitioners of medicine, and particularly of ophthalmology. In the first place, its size (7 by 10¼ inches, 243 pages), binding (light green library buckram), paper (medium gloss), and type (12-point standard) make it a comfortable book to handle and use. Its format is attractive, and it is well indexed. Secondly, its text is faithful to the teaching of the dif-

ferential diagnosis of common diseases of the eyeground, and its method direct. In the third place, the descriptive handling of normal anatomy and its deviations in disease is clear, concise, and adequate for teaching. Finally, the diagnostic inferences that are drawn from ophthalmoscopic evidence of structural changes in the eyegrounds are cautious and conservative where they attempt evaluation of systemic disease.

The text commences with a consideration of the normal fundus and discusses congenital anomalies before considering specific diseases of the retina, choroid, macula, and optic nerve. One chapter is devoted to glaucoma. Photographs of fundi in black and white are used freely, often in contrasting pairs. By this arrangement, apparently similar conditions are presented in a manner that permits easy explanation of common and distinguishing features. Legends are arranged in columns beneath each of the prints to provide a point by point consideration of salient differences. This parallel consideration of differences remains a forceful teaching device. The use of color photographs in place of black and white would obviously be excessively expensive. Bibliographic support of statements is extensive, and each subdivision of a subject is followed by a "literature discussion." In these sections the more pertinent of the references are synopsized, and the bibliography becomes more meaningful. The value of this book lies in its lucid readability and in its effective presentation of diagnostic considerations. In this area it can be classed as superior to many of the similar textbooks for medical students and interns in ophthalmology. Nonophthalmic practitioners should find it a most instructive aid to recognizing and understanding eyeground changes. The book offers more advanced students and practicing ophthalmologists a well-organized review of the differential diagnosis of common diseases of the eyeground and a means of rapid reference to specific subject matter.—*Comdr. E. A. Hynes, MC, USN*

Nutrition in Health and Disease, by *Lenna F. Cooper,* B. S., M. A., Sc. D.; *Edith M. Barber,* B. S., M. S.; *Helen S. Mitchell,* A. B., Ph. D.; and *Henderika J. Rynbergen,* B. S., M. S. 12th edition. 790 pages; 130 illustrations, 5 in color. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $4.50.

The publication of this new edition marks the completion of a quarter-century during which this textbook has been recognized as an outstanding teaching guide and standard reference in this field. It has been completely revised and brought up to date to reflect the rapid progress made in the science of nutrition by the practical application of research during recent years.

In the section on principles of nutrition, the authors emphasize normal metabolism and nutrition throughout the entire life

span and discuss regional, national, and cultural food patterns and the significance of nutrition as a national and international issue today. The chapters dealing with "Diet in Disease" have been revised in accordance with currently accepted methods of the dietary management of the sick. The chapter on obesity has been rewritten and is particularly helpful in its practical approach to this problem.

The revised section on food selection and preparation coordinates the discussion of foods and their preparation in an adequate, concise, and readable manner. A new chapter on therapeutic diets with special attention to low sodium recipes and a table on the cholesterol content of food have been added and there is a glossary of scientific terms and an excellent list of selected references.

The material in this textbook is primarily designed to meet the needs of the bedside nurse, but it is also of value as a reference for the public health nurse, the doctor, and the dietitian or the nutritionist, especially to those engaged in teaching subjects in this field.—*Col. M. E. Perry, USAF (WMSC)*

Handbook of Treatment of Acute Poisoning, by *E. H. Bensley,* M. B. E., B. A., M. D., and *G. E. Joron,* B. A., M. D., C. M. 201 pages. Renouf Publishing Co., Ltd., Montreal, Canada, 1953. Price $2.50.

The primary purpose of this handbook is to help the physician who has had no special experience in toxicology when suddenly called upon to treat patients with acute poisoning. Its secondary purpose is for use in teaching the management of acute poisoning to students of medicine, nursing, and first aid.

The simplicity of arrangement of the information is admirable. One section deals with basic principles and the general plan and methods of treatment. A second and larger section lists alphabetically the common types of acute poisoning and their treatment. Emphasis in chronologic order on lifesaving measures is clearly given. The names of 39 groups of acute poisons, each followed by an extensive listing of component drugs and chemicals by common, technical, and trade names, serve as the headings for detailed descriptions of clinical management. These are all cross-indexed. As the first paragraph of the book points out, an exact knowledge of the poison involved is not prerequisite to prompt and effective treatment.

This compact and up-to-date handbook is highly recommended for the training course, the reading shelf, and the emergency room, where interns or others may receive calls for assistance in cases of acute poisoning.—*Lt. Col. R.L. Cavenaugh, MC, USA*

Current Problems in Psychiatric Diagnosis, edited by *Paul H. Hoch*, M. D., and *Joseph Zubin*, Ph. D. 291 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1953. Price $5.50.

This publication contains the proceedings of the forty-first annual meeting in 1951 of the American Psychopathological Association and covers a wide variety of topics of current interest. Papers are presented by 24 authors and discussants, and each article is a searching documentary of present thinking. The presidential address by Dr. Lauren H. Smith, "The Responsibility of Psychiatry," is one which could be read with profit by all psychiatrists. The section of "Nosology and the Law," by Dr. Fred V. Rockwell, is thought-provoking and timely. Dr. Nathan W. Ackerman's paper on "Psychiatric Disorders in Children" presents his modification of Brown, Pollock, and Potter's etiologic classification, emphasizing his opinion that the personality of the child should not be dissociated from the environment, and that the classification guide should be a faithful portrayal of the individual patient in action. This book is recommended to the psychiatrist for inclusion in his library, as a worth-while addition to current literature.—*Capt. T. P. Rogers, MC, USN*

Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Blood Vessels, by *The Criteria Committee of the New York Heart Association, Inc: Harold E. B. Pardee*, M. D., Chairman; *Arthur C. Degraff*, M. D.; *Clarence E. de la Chapelle*, M. D.; *Cary Eggleston*, M. D.; *Charles E. Kossmann*, M. D.; *Edwin P. Maynard*, Jr., M. D.; *John B. Schwedel*, M. D.; *Harold J. Stewart*, M. D.; and *Irving S. Wright*, M. D. 5th edition. 359 pages; illustrated. New York Heart Association, Inc., New York, N. Y., 1953.

This is the fifth edition of a handbook first published in 1928 and sponsored by the American Heart Association. For the first time, it includes a section concerning diseases of the peripheral vessels. The discussion of congenital heart disease has been expanded, and the sections on roentgenologic, electrocardiographic, and pathologic diagnoses have been revised.

A new term, "innocent murmur," is introduced as a substitute for "functional murmur." The terms "potential heart disease" and "possible heart disease" have been replaced with "no heart disease, predisposing etiologic factor"; and "undiagnosed manifestation" respectively. The word "atrial" has been substituted for "auricular."

The book includes much useful information for the internist and cardiologist. Every physician will improve his diagnosis of cardiac diseases by including an etiologic, anatomic, and physiologic diagnosis, plus the cardiac functional capacity and the patient's therapeutic classification, as outlined in this book.

—*Col. R. P. Johnson, MC, USA*

Injuries of the Spinal Cord, edited by *George C. Prather*, M. D., F. A. C. S., and *Frank H. Mayfield*, M. D., F. A. C. S. 396 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $8.75.

Any physician caring for a patient with an injury of the spinal cord should read this book, and all hospitals should have it in their library. It is an excellent, well-organized collection of ideas and information vital to the proper understanding and care of these unfortunate but not hopeless people.

For convenience, the book is divided into sections, each concerned with a special aspect of the problem and each written by a man specialized in his field and obviously well acquainted with the unusual problems presented by the total or partial paraplegic. A historical note is followed by the neurosurgical, urological, nutritional, and orthopedic sections and there is, appropriately, a chapter on associated injuries and complications. The treatment of decubitus ulcers is described in a separate division. Rehabilitation and psychological considerations of the patient as a whole complete the discussions. These separate sections, written by different men, are brought together in unity, as the care of the patient must be.

Dedicated to the Military Personnel of the United States Forces, who during World War II received injury of the spinal cord, this book stands as a tribute to them. It stands also as a tribute to the doctors who, so poorly informed as to these patients' care at the beginning of that conflict, learned much. This summarizes for future reference one of the most important medical and surgical advancements of that war.—*Lt. Comdr. F. B. Clare, MC, USN*

Surgical Pathology, by *Lauren B. Ackerman*, M. D. 836 pages with 913 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $14.50.

I agree with the author's preface that this book is only an introduction to the vast field of surgical pathology. Most chapters are largely devoted to the discussion of tumors, their pathology and their treatment. Frequently, the description of non-neoplastic disease is too brief.

Diseases are discussed by organ systems. As might be expected with a first edition, several errors in spelling and labeling are noted. Both gross and microphotographs are numerous and of excellent quality. The concepts of etiology, diagnosis, and treatment are up to date and the bibliography includes recent literature and could well be used to supplement the information given in the text.

This book is recommended for use by medical students and physicians interested in surgical pathology.

—*Capt. M. E. Thomas, MC, USA*

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The Team Plan, A Manual for Nursing Service Administrators, by *Dorothy Perkins Newcomb*, R. N., B. S. Foreword by *Ruth Sleeper*, R. N., M. A., L. H. D. 82 pages; illustrated. G. P. Putnam's Sons, New York, N. Y., 1953. Price $1.50.

Written in a concise yet informal style, this manual is directed to administrators of nursing services. It is offered as one solution for the familiar problem of meeting increased demands for nursing care with minimum staffs of nursing personnel. The introductory chapter briefly but clearly reviews over-all nursing service problems. The basic ideas of the team plan are offered in the second chapter, followed by the effect of the plan on the nursing service and on the quality of nursing care rendered. The utilization of the student nurse and incorporation of other nursing personnel within this program is followed by a discussion of how best to implement the plan and of the resistance to change from established routines that may be expected.

The manual has much appeal with its realistic approach. It is evident that the author is well acquainted with nursing service situations and personnel problems. Some questions that may arise are how can one find sufficient "team leaders" with the necessary qualifications, or how can diverse abilities easily be combined and directed toward the common objective. No clear design for the team plan for 24-hour nursing care is included, but it is suggested that adaptations for specific nursing situations will have to be made. A challenge is presented by the manual to all those having difficulty in meeting present-day nursing care demands to try the team plan.—*Lt. Comdr. F. E. Quebbeman, NC, USN*

Copying and Duplicating Medical Subjects and Radiographs, by *H. Lou Gibson.* 75 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $5.

This small volume provides readily understandable instructions for the beginner in copying and duplicating medical material. It is also designed to serve as a summary for the experienced worker in the field of medical reproductions.

The copying of black and white originals and the duplicating of colored transparencies are well illustrated and described. Data are given on films that are most satisfactory for copying in black and white. Illustrations, useful for copying colored originals, are included to show the effects of different types of film and of contrasting filters. There is a chapter on the duplication of radiographs for projection, exhibition, or publication.

This book should provide a ready reference for those interested in copying or duplicating medical material for use as visual aids in teaching, or for publication.

—*Comdr. V. E. Martens, MC, USN*

Adrenal Cortex, Transactions of the Fourth Conference, November 12, 13, and 14, 1952, edited by *Elaine P. Ralli*, M. D. 165 pages; illustrated. Sponsored by Josiah Macy, Jr. Foundation, New York, N. Y. Printed by Foundation Press Inc., Packanack Lake, N. J. Price $3.50.

Under the auspices of the Josiah Macy, Jr. Foundation four conferences have been held in an effort to expand and integrate knowledge of the adrenal cortex. This volume reports the fourth such meeting, and the discussants represent a large number of the outstanding workers in the field. The following subjects are reviewed: permissive action of adrenal cortical hormones; mechanisms through which the adrenal cortex produces qualitatively different effects; evidence, nature, and site or production of a salt hormone secreted by the adrenal gland; and adrenalectomy in man. The first three subjects have limited interest for the clinician and are directed to physiologists and those internists in the field of endocrinology. The discussion of adrenalectomy, however, is of current importance to both internists and surgeons and is highly recommended.

The limitations inherent in any panel discussion are not entirely escaped in this volume. The original point of discussion, particularly in the chapter on permissive actions, is incompletely expanded by virtue of a drift of emphasis to the general subject of stress. As anticipated more provocative points are raised than can be discussed profitably in a short presentation.

Upon completion of this volume the reader retains an accurate picture of the complexity of research in adrenal physiology, and great respect for the panelists and for their work.

—*Lt. D. B. Carmichael, Jr., MC, USN*

Ballistocardiography, The Application of the Direct Ballistocardiograph to Clinical Medicine, by *William Dock*, B. S., M. D.; and *Robert A. Mendelbaum*, B. A., M. D. 293 pages; with 153 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $9.50.

A large amount of data on the physiology of circulation and respiration is given as background for the clinical discussion of ballistocardiography in this volume which is amply illustrated by large graphic diagrams. The mathematical aspects of the subject are reduced to simplest terms and illustrated in appendixes 1 and 3. The authors describe in practical detail the construction of their own types of simple photoelectric and electromagnetic ballistocardiographs. A broader discussion of ballistocardiographs and technics is also included.

Clinical application of ballistocardiography has been a natural result of the development of portable simple equipment. The authors have satisfactorily organized and illustrated their clinical experience in normal subjects, and in patients with pulmonary dis-

eases, acute myocarditis, heart failure, coronary artery disease, arterial hypertension, valvular heart lesions, conduction defects, and cardiac arrhythmias. The effect of tobacco smoking on the ballistocardiogram is included in the presentation. The technic of reading and classifying the ballistocardiogram is fully described, and the place of ballistocardiography in evaluating the cardiac patient is presented realistically. The role of this technic in surgery, obstetrics, industrial medicine, and insurance examinations is emphasized. An excellent bibliography is provided.

This book lays the foundation for sensible clinical use of the ballistocardiogram. It is important because of the number of physicians who are beginning to use this instrument. Internists and cardiologists will find it of value.—*Col. B. E. Pollock, MC, USA*

Classics in Clinical Dermatology With Biographical Sketches, by *Walter B. Shelley,* M. D., Ph. D., and *John T. Crissey,* M. D. Introduction by *John H. Stokes,* M. D. 467 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $10.50.

This book is the fruition of an enormous amount of effort, as anyone will realize who has attempted to trace down an original medical description, especially those involving foreign languages. If for no other reason the authors would therefore merit a "well done," considering that they have presented 143 original versions of dermatologic entities.

Primarily the offering will be of interest to dermatologists, and especially to those having an interest in the origins and genesis of the speciality. For these it is indispensable, giving as the authors state, "every sentence exactly as the authors wrote it." In the translations, where apparently there might be contention as to meaning, the foreign word is quoted, as well as the author's English equivalent. Secondarily, it will be of interest to other specialities, because contributions to dermatology have been made by ophthalmologists, surgeons, pathologists, and others, as is true of all fields of medicine. Students will be intrigued by descriptions from as far back as 1757 which have never been improved upon. No one will fail to be stimulated by the stature of the pioneers and their driving urge to guide through the medical maze.

In the preface, John Stokes highlights what the work most admirably sets forth: that in dermatology, and probably in other specialities, the clinician is king. Progress in medicine now, as in the beginning, arises from a painstaking study of the patient.

The work is recommended unreservedly, not only as an invaluable source book, but also as highly enjoyable reading material.
—*Capt. C. D. Bell, MC, USN*

The Neurophysiological Basis of Mind, The Principles of Neurophysiology, by *John Carew Eccles.* The Waynflete Lectures, Delivered in the College of St. Mary Magdalen, Oxford, in Hilary Term, 1952. 314 pages; illustrated. Oxford University Press, New York, N. Y., 1953. Price $6.50.

This is a scholarly series of lectures by an unquestioned authority in the field of neurophysiology. It differs from most books on neurophysiology in that it is directed at psychiatry rather than neurology.

The book devotes its eight chapters to a fairly orderly and general development of some current concepts of "mind." It begins with a discussion of nerve conduction, proceeds to the synapse, and ultimately to neural organization of higher and higher complexity. Prolonged functional changes following repetitive use are crucial to the development of the book. As the author proceeds up the neuraxis, the material becomes somewhat speculative but expresses the current opinions of some of our foremost neurophysiologists. This speculation is quite justifiable inasmuch as the missing link between neurophysiology and psychiatry is a major one and is not really approachable by laboratory technics in the same sense as conduction by a nerve fiber.

As is usual in discussing theories of mind, the final chapter, "The Mind-Brain Problem," becomes bogged down at times in semantic difficulties. The reaction to this will vary greatly from reader to reader, but should not greatly detract from the usefulness of the book because, relative to most works on mind, this is a masterpiece of clarity.

Considering the complexity of the task, the author's job is well done. The material is well introduced, elaborated, summarized, and documented. There are 88 appropriate figures. This book will be of interest to those who seek an up-to-date, detailed account of the neurophysiologist's views on mental function that will not cause them to lose their way in anatomic and mathematical digressions. It is a wholesome approach and is highly recommended.

—Lt. (jg) W. H. Oldendorf, MC, USNR

Aspects of the Psychology of the Tuberculous, A Psychosomatic Medicine Monograph, by *Gordon F. Derner,* Ph. D. 119 pages; illustrated with charts. Paul B. Hoeber, Inc., New York, N. Y., 1953. Price $3.50.

This monograph presents an intensive analysis of the personality factors in persons with tuberculosis. The major thesis is an inquiry into the hypothesis, often found in psychologic investigations of physical disability and illness, that there is a characteristic "personality" which is typical of those who are handicapped in some physical way. Each patient was interviewed for from 8 to 10 hours with a single session usually lasting about half an hour. The

methods of psychologic appraisal included the use of clinical interviews, standard psychometric tests, rating scales, specially designed tests, and projective technics. The interviews made use of a controlled interview schedule which covered the attitudes and feelings of the tuberculous patient toward the disease, the diagnosis, the symptoms, the treatment, and the effects of the disease on the person's life. The author reports on these attitudes, feelings, and personality characteristics of hospitalized tuberculosis patients with considerable verbatim extracts which permit a detailed view of the psychologic aspects of the tuberculous. It is these factors in the tuberculosis situation which clarify Osler's suggestion that what happens in the patient's head is more important than what happens in his chest.

The present study as well as the very few other investigations into the "psychologic characteristics" of tuberculous patients have not produced very clear-cut results. Some of the author's findings reveal that "there was no unique tuberculous personality * * * but there was a wide variety of disturbed behavior * * *. The most frequent emotions were fear, apprehension, and depression * * *. The major activities of the patients were reading, handicrafts, and radio listening." These observations help explain why rest is the basic ingredient in the treatment of tuberculosis, which ideally means relaxing mentally and emotionally as well as physically. This monograph should be of value to anyone interested in tuberculosis whether he or she be nurse, physician, social worker, psychologist, or worker in the general field of psychosomatics.

—Lt. Col. F. Killian, Jr., USAF (MSC)

A Guide to Human Parasitology for Medical Practitioners, by *D. B. Blacklock*, M. D. (Edin.). D. P. H. (London), D. T. M. (Liver.), and *T. Southwell*, D. Sc., Ph. D. Revised by *T. H. Davey*, M. D. (Belf.), D. T. M. (Liver.). 5th edition. 228 pages; with 3 colored plates and 120 illustrations in the text. The Williams & Wilkins Co., Baltimore, Md., 1953. Price $5.50.

Diagnosis and treatment of illness due to parasitic infections depends upon identification of the parasite, or its eggs, in a suitable specimen of feces, urine, blood, or other material. All physicians have had some training in these technics but, because few feel confident of their ability to make an adequate examination of material for parasites, they refer the problem to the clinical laboratory. Unfortunately, most laboratory technicians dislike stool examinations and are inexperienced in the identification of any parasites they may find. This small volume will prove valuable to both the physician and the laboratory technician. The book is well written and illustrated; the essential material is presented concisely and in such form that inexperienced readers may readily obtain the information sought. Only human parasites of clinical importance are discussed, and the emphasis is on diagnosis.

Tables, differential keys, and excellent drawings are provided to assist in identification of parasites. Life cycles are shown diagrammatically. In addition to discussion of intestinal parasties, there are separate chapters covering spirochetes, trypanosomes, leishmania, malarial parasites, and filariae. Brief statements concerning prophylaxis and control measures have been added in this edition. Treatment is not discussed.

The parasitologist does not need this book, but most other physicians, health officers, and laboratory technicians will find it very useful.—*Lt. Col. B. H. Sullivan, Jr., MC, USA*

Clinical Unipolar Electrocardiography, by *Bernard S. Lipman*, A. B., M. D., and *Edward Massie*, A. B., M. D. 2d edition. 309 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $6.50.

The descriptive title of this book indicates the now widespread acceptance, through popular usage, of the term "unipolar" to designate the technic in electrocardiography of pairing an electrode close to the heart with a stabilized indifferent electrode or with one distant from it. The authors' objective in their first edition of producing a simple and practical manual has been retained in this edition of the expanded teaching booklet. New material has been incorporated on cardiac arrhythmias, myocarditis, and congenital heart disease. Minor changes have been made in the original chapters on physiologic principles, electrical position of the heart, ventricular enlargement, bundle branch block, myocardial infarction, and abnormal electrographic patterns. While extremely basic and in some portions oversimplified, the book is an excellent synopsis of the essentials in the field. Controversial theories are avoided or fairly presented. The excellent schematic diagrams, especially in the section on myocardial infarction, should greatly aid the beginner in these studies.

The section on illustrative electrocardiograms includes individual records clearly shown and uniformly and neatly mounted. Reference numbers to these in the text would enhance comparison to the diagrams shown. The bibliography, while complete, would also aid the reader's further investigation if cross-referenced to the text. Perhaps the most important statement of the book is contained in the summary. It merits repetition on the top of every page for the beginner, stressing the caution to be observed in interpreting the electrocardiogram as only a graphic representation of the electrical activity of the heart to be evaluated only when considered in the light of the patient's clinical course and laboratory data. This caution could well have been used in the authors' presentation of patterns of myocardial infarction in which an anatomical localization is attempted.

—*Brig. Gen. M. S. White, USAF (MC)*

Pharmacology and Therapeutics in Nursing, by *Marion Sylvester Dooley,* A. B., M. D., and *Josephine Rappaport,* R. N., M. A. 2d edition. 486 pages; illustrated graphs and charts. McGraw-Hill Book Company, Inc., New York, N. Y., publishers, 1953. Price $4.50.

In this revision, the use of drug therapy is correlated with nursing measures, and many new drugs with their uses, actions, toxicity, dosage, technic of administration, and dose forms are introduced. The authors' aim of contributing to total patient-care planning is evidenced by the order in which the classes of drugs are included and by the sections within the chapters devoted to nursing. This gives the nurse a clearer insight into the action of the drugs. The subject matter proceeds from the background of the uses of drugs, through the knowledge necessary for their administration, to the specific drugs acting on different systems of the body. This sequence contributes to the over-all understanding of the nurse. An especially interesting and useful feature is the outlining of the treatment of poisoning by the most common drugs. This book will be very useful as a textbook or as an additional reference book for a professional library.

—*Lt. Comdr. A. Burk, NC, USN*

Psychosomatic Approach to Gynecology and Obstetrics, by *Fritz Wengraf,* M. D. American Lecture Series, Publication Number 164, A Monograph in the Bannerstone Division of American Lectures in Gynecology and Obstetrics, edited by *E. C. Hamblen,* B. S., M. D. 346 pages. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $6.75.

The author of this monograph is well prepared to present such a treatise, as his training has included the field of psychiatry as well as that of obstetrics and gynecology. In this particular book he is very much the neuropsychiatrist. In his preface the author makes a plea for the return to the "art of medicine," which he believes can be easily passed over in this age of specialization. He then defines at length his concept of psychosomatic medicine.

The book is divided into six sections covering major and minor gynecology, obstetrics, special problems, and psychotherapeutics. The special problems of frigidity, dysmenorrhea, menstrual aberrations, and the emotional disorders of puberty and the menopause are presented at length. The chapters of preoperative and postoperative care of neurotic patients present aspects of this problem easily ignored by the busy practitioner. These specific problems are illustrated by approximately 50 actual case reports; these cases, however, represent extreme neuropsychiatric problems normally falling under the jurisdiction of the psychiatrist rather rather than the gynecologist. Of most value is the section on psychotherapeutics, to which the author devotes three chapters written in an easily read yet concise fashion. The bibliography lists over 500 books and original articles.

Like most books dealing with a particular aspect of a speciality, or as in this case, an approach to it, this monograph is designed more as closely allied extracurricular reading than as study material for the student or busy practitioner.

—Lt. Comdr. C. E. Weber, MC, USN

Handbook of Dietetics for Nurses, by *Catherine F. Harris*, S. R. N., R. C. N. Foreword by Professor *S. J. Cowell*, M. B., F. R. C. P. 196 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., publishers, 1953. Price $4.

There has long been a need for a new dietetics handbook for nurses. This carefully documented book has compact information for the student nurse and is a source of quick reference for the graduate nurse who may or may not be in the field of dietetics.

The relationship between nutrition and health is pointed out simply and concisely, with emphasis on diet therapy in specific diseases and in states of impaired nutrition. The complete science of nutrition is explained thoroughly and succinctly, the outline form facilitating ease in learning. The author introduces enough physiology into her explanations to enable the student nurse to correlate nutrition with body functions in health and disease. Her comparative tables are compilations of good material.

The author's choice of foods for discussion is naturally limited due to conditions in her country, but this is helpful because it would enable nurses to substitute food products in the event of a food shortage.—*Lt. A. R. Enger, NC, USN*

Human Embryology, by *Bradley M. Patten*, A. B., A. M., Ph. D. 2d edition. 798 pages; with 453 illustrations. The Blakiston Co., Inc., New York, N. Y., 1953. Price $12.

Although the second edition of this excellent textbook of human embryology appears only seven years after the first was published, it incorporates notable advances in two distinct fields. The more important of these concerns the development of the heart and great vessels. A better understanding of developmental disturbances resulting in abnormalities in vascular pattern, or in congenital defects of the heart, permits better surgical management of these conditions. The related sections have been amplified and 12 new or improved illustrations added.

The other field of great advance is in the knowledge of very early development and the initial phases of implantation, as they actually occur in human beings. These sections have been rewritten to describe early stages as observed in human embryos recently obtained by Hertig and Rock, rather than as inferred from conditions in other mammals.

The book is clearly written, well illustrated, and adequately indexed. To the already extensive bibliography of the first edition has been added references to 260 pertinent articles that have appeared in the 1945-1952 interval. This textbook should be useful to both medical students and physicians.

—*Capt. B. F. Avery, MC, USN*

Antibiotics, by *Robertson Pratt,* Ph. D., and *Jean Dufrenoy,* D. Sc. 2d edition. 398 pages; 87 illustrations, including one plate in full color. J. B. Lippincott Co., Philadelphia, Pa., 1953.

The purpose of the authors of this volume is to "present in a succinct, integrated plan the facts and principles of fundamental and permanent value relating to antibiotics." This they have accomplished. Since the first edition appeared in 1949, research and important discoveries in this field have been extensive. In the second edition these discoveries have been considered in relation to facts and principles previously established, some of which have had to be re-evaluated. The material of the earlier edition has been revised, and five new chapters have been added.

The historical background of the concept of antibiosis, the natural sources of antibiotics, the criteria for their identification, and an explanation of the concept of antibiotic spectra make up the first chapter. The biologic significance of fields of diffusion, with the concept of threshold and optimal concentrations, a discussion of antibiotics and chemotherapy, and a list of requisites for an ideal antibiotic complete the section on the fundamental aspects of the subject.

Under industrial aspects, the authors discuss production by fermentation, and the screening and assaying of antibiotics. The section on applied aspects deals in detail with the more important antibiotics and also discusses mixed antibiotic therapy. This section includes chapters on antibiotics used in dental practice and oral surgery, and in agriculture. The latter concerns those used in plant pathology, as growth stimulants, and in food processing. In the final part of the book, the authors discuss resistant strains of micro-organisms, mechanisms of antibiotic action, and some of the present and future effects of the development of antibiotics on social and economic conditions.

This book is an excellent presentation of the subject. The tables, diagrams, charts, and appendices are helpful, and the lists for suggested reading, which conclude each chapter, are well selected. It is written from the scientific viewpoint with no attempt to popularize the material, but it is not too technical to be comprehensible and interesting to the general reader.

—*Comdr. R. L. Taylor, MSC, USN*

Emergency Surgery, *Bernard J. Ficarra,* M. D., Supervising Editor. 1,000 pages; 578 illustrations. F. A. Davis Company, Philadelphia, Pa., 1953.

This text is not limited solely to surgical problems of traumatic origin as one might infer from the title. It is encouraging to find a book, covering so much diversified material, which continually stresses that emergencies in purely elective procedures may require more heroic measures to sustain the patient than in the severest traumatic problem. The 70 chapters are organized into regional and organic groupings and cover the span of emergencies from the prenatal to the geriatric period. Considerable material is also included on the management of casualties from bombings and similar catastrophies.

This book does not pretend to analyze completely each emergency problem presented because entire texts have been written on electrolyte balance, cardiac arrest, postoperative psychosis, massive gastrointestinal hemorrhage, and other emergency conditions. Several chapters are unusually well presented and one particularly worthy of note is that by De Palma and Snedden on "Acute Nonfracture Injuries of the Shoulder."

The young surgeon will find himself very well repaid by keeping this volume within reach during his active daily practice. It will broaden immeasurably his experience and help him to eliminate any "acts of omission" in his competent management of the surgical emergency.—*Col. D. Gold, USAF (MC)*

Peptic Ulcer, Pain Patterns, Diagnosis and Medical Treatment, by *Lucian A. Smith,* M. D., and *Andrew B. Rivers,* M. D. 576 pages; illustrated. Appleton-Century-Crofts, Inc., New York, N. Y., 1953.

The authors' objective in this book is to aid in the accurate diagnosis and satisfactory medical management of peptic ulcer disease. They take particular pains to describe the criteria for precise diagnosis of the various complications of the disease, and to outline the definitive therapy indicated for each complication. The major value of this volume lies in the clinical evaluation of various pain patterns in relation to the underlying disturbed pathophysiology, in particular that of penetration and perforation. There are excellent clinical observations on an adequate number of verified primary and postoperative recurrent peptic ulcers ranging from the esophagus to the ileum, and diagrammatic illustrations of the pain patterns in each case.

All aspects of the subject matter are given due consideration, as evidenced by the chapter headings: history, anatomy of abdominal pain, pathologic anatomy, physiology, etiology, clinical history and physical examination, laboratory aids, esophageal

ulcer, gastric ulcer, duodenal ulcer, Meckel's diverticulum, postoperative peptic ulcer, gastrojejunal and gastroileal ulcer, hemorrhage, obstruction, free perforation, subphrenic abscess, endoscopic evaluation, roentgenologic diagnosis, and treatment of complications.

This book is highly recommended to all surgeons, internists, and general practitioners for improving their diagnosis and care of ulcer patients.—*Comdr. L. J. Pope, MC, USN*

The Year Book of Medicine (1953-1954 Year Book Series), edited by *Paul B. Beeson,* M. D.; *Carl Muschenheim,* M. D.; *William B. Castle,* M. D.; *Tinsley R. Harrison,* M. D.; *George B. Eusterman,* M. D.; and *Robert H. Williams,* M. D. 736 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $6.

This volume of the well-known medical year book is a series of digests of important articles in the field of internal medicine which have been published during the current year. It is divided into six sections that include infectious diseases, the chest, the blood-forming organs, the cardiovascular-renal system, the digestive system, and metabolism. Each part is edited by a recognized authority in his field and presents an excellent method of keeping abreast of important work done during the current year. Articles are reviewed from British, Canadian, Scandinavian, and French publications, as well as from this country, and are well chosen for their relative significance in the field of medical progress. Controversial subjects are presented from several points of view and the reader is urged to consult the original article for more detailed study. The editorial comments are numerous and enhance the value of the book. A separate index is provided for subjects and authors. Graphs are reproduced from the original article when indicated.

This volume provides a means for the busy internist to cover medical literature, and is useful both as a ready reference to information and as a broad review of advances in medicine during the past year. On the whole it is a worth-while addition to the library of the medical practitioner.

—*Comdr. K. M. Lacer, MC, USN*

NEW BOOKS

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

Abstracts on Military and Aviation Ophthalmology and Visual Sciences, Volumes I and II, by *Conrad Berens,* M. D., F. A. C. S., Professor of Clinical Ophthalmology, New York University; Executive Ophthalmic Surgeon, Pathologist and Director of Research, New York Eye & Ear Infirmary; Consultant in Ophthalmology to the Surgeon General, United States Air Force; and to the American Board of Ophthalmology; President, Pan American Association of Ophthalmology; Vice President, National Society for the Prevention of Blindness; Managing Director, Ophthalmological Foundation, Inc., New York; President, Snyder Ophthalmic Foundation; Chief Ophthalmologist, French Hospital, New York; Consulting Ophthalmologist, Woman's Hospital, Willard Parker Hospital, and the New York Infirmary, New York; Member, American Ophthalmological Society, Association for the Advancement of Science, Illuminating Engineering Society, Society of American Bacteriologists, and Association for Research in Ophthalmology; Past President, American Academy of Ophthalmology; and Otolaryngology, and *L. Benjamin Sheppard,* M. D., Assisttant Professor of Ophthalmology, Medical College of Virginia; Consultant in Ophthalmology, Veterans Administration Hospital; Member, American Medical Association, Virginia Medical Society, Richmond Academy of Medicine, American Academy of Ophthalmology and Otolaryngology, Association for Research in Ophthalmology, and the Pan American Association of Ophthalmology. Volume I, 539 pages. Volume II, 425 pages. The Biological Sciences Foundation, Ltd., Washington, D. C., 1953. Price $40, set.

The Year Book of Obstetrics and Gynecology (1953-1954 Year Book Series), edited by *J. P. Greenhill,* B. S., M. D., F. A. C. S., Professor of Gynecology, Cook County Graduate School of Medicine; Attending Gynecologist, Cook County Hospital; Attending Obstetrician and Gynecologist, Michael Reese Hospital; Associate Staff, Chicago Lying-in Hospital; Author of Office Gynecology, Obstetrics in General Practice and Principles and Practice of Obstetrics. 567 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $6.

Hypersplenism and Surgery of the Spleen, by *William Dameshek,* M. D., and *C. Stuart Welch,* M. D., Pratt Diagnostic Hospital, New England Center Hospital, and Tufts College Medical School, Boston, Mass. Based on exhibits presented at the Annual Meetings in 1947 and 1951 of the American Medical Association, Recipients in 1951 of the A. M. A. Silver Medal. 84 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1953. Price $10.

Space Travel, by *Kenneth W. Gatland* and *Anthony M. Kunesch.* 205 pages; illustrated by photographs and drawings. Drawings by *J. W. Wood* and *R. A. Smith.* Philosophical Library, New York, N. Y., 1953. Price $4.75.

Modern Clinical Psychiatry, by *Arthur P. Noyes*, M. D., Superintendent, Norristown State Hospital, Norristown, Pa.; Associate Professor of Psychiatry, Graduate School of Medicine, University of Pennsylvania. 4th edition. 609 pages. W. B. Saunders Co., Philadelphia, Pa., 1953.

Textbook of College Hygiene, by *Oliver E. Byrd*, Ed. D., M. D., Professor of Health Education, Stanford University. 443 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

Handbook of Differential Diagnosis, by *Harold Thomas Hyman*, M. D., Author of An Integrated Practice of Medicine. 716 pages. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $6.75.

Peripheral Nerve Injuries, Principles of Diagnosis, by *Webb Haymaker*, M. D., Chief, Neuropathology Section, Armed Forces Institute of Pathology, Washington, D. C., and *Barnes Woodhall*, M. D., Professor of Neurosurgery, Duke University School of Medicine, Durham, N. C. 2d edition. 333 pages; 272 illustrations. W. B. Saunders Co., Philadelphia, Pa., 1953.

Bacterial Genetics, by *Werner Braun*, Ph. D. 238 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

Fundamentals of Biochemistry in Clinical Medicine, by *Niels C. Klendshoj*, M. D., Assistant Professor of Pathology, Director of the Division of Toxicology, University of Buffalo, School of Medicine; Director of the Department of Biochemistry, Buffalo General Hospital, Buffalo, N. Y. 276 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $7.75.

Treatment of Toxic Goiter With Radioactive Iodine, by *Lindon Seed*, M. D., Director, Isotope Laboratory, Grant Hospital; Clinical Associate Professor of Surgery, College of Medicine, University of Illinois, and *Theodore Fields*, M. S., Assistant Director, Radioisotope Laboratory, Hines Hospital; Certified Medical Nuclear Physicist, American Board Radiology; Instructor in Radiology, Northwestern University Medical School. Preface by *George V. LeRoy*, M. D., Associate Dean, Division of Biological Sciences, University of Chicago. American Lecture Series, Publication Number 197, A Monograph in American Lectures in Endocrinology, edited by *Willard O. Thompson*, M. D., Clinical Professor of Medicine, University of Illinois College of Medicine; Managing Editor, Journal of Clinical Endocrinology and Metabolism; Editor, Journal of the American Geriatrics Society, Chicago, Ill. 116 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $3.75.

A Source-Book of Medical Terms, text by *Edmund C. Jaeger*, D. Sc., Formerly, Head, Department of Zoology, Riverside College, Riverside, Calif.; foreword by *Irvine H. Page*, M. D., Director, Research Division, Cleveland Clinic Foundation, Cleveland, Ohio. 145 pages; illustrations by *Lloyd Mason Smith* and the *Author*. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $5.50.

Clinical Disorders of the Heart Beat, by *Samuel Bellet*, M. D., Director, Division of Cardiology, Philadelphia General Hospital; Director, Division of Cardiovascular Diseases, Graduate Hospital, University of Pennsylvania; Cardiologist, Einstein Medical Center; Associate Professor of Cardiology, Graduate School of Medicine, University of Pennsylvania; Assistant Professor of Medicine, School of Medicine, University of Pennsylvania; Clinical Professor of Medicine, Women's Medical College, Philadelphia, Pa. 373 pages; 164 illustrations. Lea & Febiger, Philadelphia, Pa., 1953. Price $8.50.

Electrical Methods of Blood-Pressure Recording, by *Frank W. Noble,* M. E. E., National Heart Institute, National Institutes of Health, Public Health Service, Federal Security Agency, Bethesda, Md. American Lecture Series, Publication Number 155, A Monograph in American Lectures in Medical Physics, edited by *Otto Glasser,* Ph. D., Department of Biophysics, Cleveland Clinic Foundation, Cleveland, Ohio. 56 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $3.

Clinical Management of Behavior Disorders in Children by *Harry Bakwin,* M. D., Professor of Clinical Pediatrics, New York University; Visiting Physician, Bellevue Hospital; Attending Pediatrician, University Hospital, and *Ruth Morris Bakwin,* M. D., Associate Professor Clinical Pediatrics, New York University; Associate Visiting Physician, Bellevue Hospital; Director of Pediatrics, New York Infirmary. 495 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

Modern Trends in Urology, edited by *E. W. Riches,* M. C., M. S., F. R. C. S., President, British Association of Urological Surgeons (Home and Overseas); Surgeon and Urologist, The Middlesex Hospital, London; Senior Urologist, Royal Masonic Hospital, London; Urologist, St. Andrew's Hospital, Dollis Hill, and Hospital of St. John and St. Elizabeth, London; Consulting Urologist to the Army and the Ministry of Pensions (Spinal Injury Centre); Member of Council, The Royal College of Surgeons of England; Formerly Jacksonian Prizeman and Hunterian Professor, and Member of the Court of Examiners, The Royal College of Surgeons of England; Examiner in Surgery, University of Cambridge, with a foreword by The Lord *Webb-Johnson,* K. C. V. O., C. B. E., D. S. O., T. D., M. B., LL. D., F. R. C. S. 476 pages; illustrated. Paul B. Hoeber, Inc., New York, N. Y., 1953. Price $12.50.

The Surgery of Infancy and Childhood, Its Principles and Techniques, by *Robert E. Gross,* M. D., D. Sc., William E. Ladd Professor of Children's Surgery; Harvard Medical School, Chief of Surgical Service, Children's Hospital, Boston. 1,000 pages; 1,488 illustrations on 567 figures; drawings by *Etta Piotti.* W. B. Saunders Co., Philadelphia, Pa., 1953.

Mechanisms of Urologic Disease, by *David M. Davis,* M. D., Professor of Urology Emeritus, Jefferson Medical College; Visiting Lecturer in Urology, Graduate School of Medicine, University of Pennsylvania; formerly Pathologist and Director of Research, James Buchanan Brady Urological Institute, Johns Hopkins University; Assistant Professor of Urological Surgery, in charge of Urology, University of Rochester; Nathan Lewis Hatfield Professor of Urology, Jefferson Medical College. 156 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

Collected Papers of the Mayo Clinic and the Mayo Foundation, edited by *Richard M. Hewitt,* B. A., M. A., M. D.; *A. B. Nevling,* M. D.; *John R. Miner,* B. A., Sc. D.; *James R. Eckman,* A. B., M. A., Ph. D.; *M. Katherine Smith,* B. A.; *Carl M. Gambill,* A. B., M. D., M. P. H.; *Florence Schmidt,* B. S. E.; and *George G. Stilwell,* A. B., M. D. Vol. XLIV, 1952, published June, 1953. 786 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

Fundamentals of Ecology, by *Eugene P. Odum,* University of Georgia, Athens, Ga. 384 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

Physiology of Muscular Activity, Originally by *Edward C. Schneider,* M. P. E., Ph. D., D. Sc. By *Peter V. Karpovich,* M. P. E., M. D., Professor of Physiology, Springfield College, Springfield, Mass. 4th edition. 340 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

The Year Book of General Surgery (1953-1954 Year Book Series), edited by *Evarts A. Graham,* A. B., M. D., Emeritus Professor of Surgery, Washington University School of Medicine; formerly Surgeon-in-Chief of the Barnes Hospital and of the Children's Hospital, St. Louis. With a Section on Anesthesia, edited by *Stuart C. Cullen,* M. D., Professor of Surgery and Chairman of Division of Anesthesiology, State University of Iowa College of Medicine and Hospitals. 590 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $6.

The Nursing of the Elderly Sick, A Practical Handbook of Geriatric Nursing, by *T. N. Rudd,* M. D. (London), M. R. C. P. (London), Physician, the Tiverton Hospitals and Belmont Hospital, Tiverton, Devon. 108 pages. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $2.50.

Pediatric Gynecology, With Sections on Urology and Proctology, by *Goodrich C. Schauffer,* M. D., Assistant Clinical Professor of Obstetrics and Gynecology, University of Oregon Medical School. 3d edition. 318 pages; illustrated. Year Book Publishers, Inc., Chicago, Ill., 1953. Price $7.50.

Regional Block, A Handbook for Use in the Clinical Practice of Medicine and Surgery, by *Daniel C. Moore,* M. D., Director, Department of Anesthesiology, Mason Clinic; Chief of Anesthesia, Virginia Mason Hospital, Seattle, Wash. 373 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $11.

Gourmet Cooking for Cardiac Diets, by *Florence Field.* Introduction by *Harold Feil,* M. D. 350 pages; decorations by *Vee Guthrie.* The World Publishing Co., Cleveland, Ohio, 1953. Price $3.50.

The Psychology of Personality, by *Bernard Notcutt,* Professor of Psychology in the University of Natal. 259 pages. Philosophical Library, New York, N. Y., 1953. Price $4.75.

Existential Psychoanalysis, by *Jean-Paul Sartre.* Translated and with an introduction by *Hazel E. Barnes.* 275 pages. Philosophical Library, New York, N. Y., 1953. Price $4.75.

Nuclear Physics, by *W. Heisenberg,* Director of the Max Planck Institute of Physics. Göttingen. 225 pages; illustrated. Philosophical Library, New York, N. Y., 1953. Price $4.75.

Within the Living Plant, An Introduction to Plant Physiology, by *Erston V. Miller,* Ph. D., Professor of Botany, University of Pittsburgh; Formerly Physiologist, U. S. Department of Agriculture. 325 pages; illustrated. The Blakiston Co., Inc., New York, N. Y., 1953. Price $5.

Joint ILO/WHO Committee on Occupational Health, Second Report, World Health Organization Technical Report Series No. 66. 30 pages. World Health Organization, Geneva, Switzerland, publisher, 1953. Price $0.20.

A Speculation in Reality, by *Irving F. Laucks.* 154 pages. Philosophical Library, New York, N. Y., 1953. Price $3.75.

Roger Bacon in Life and Legend, by *E. Westacott.* 140 pages. Philosophical Library, New York, N. Y., 1953. Price $3.75.

United States Army In World War II. The War in the Pacific: The Fall of the Philippines, by *Louis Morton. Office of the Chief of Military History, Department of the Army,* Washington, D. C. 626 pages; illustrated. U. S. Government Printing Office, Washington, D. C., publishers, 1953. Price $5.25.

Clinical Orthopaedics, No. 2, by *Anthony F. DePalma,* Editor-in-Chief, with the Assistance of *Five Associate Editors* and a *Board of Six Advisory Editors.* 247 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1953.